EXPERT WORKSHOP ON ANSWERING THE CALL FOR AN *African Water Revolution*

27 – 28 June 2018 | Kigali Rwanda

WORKSHOP REPORT 2018

SIWI

Stockholm Resilience Centre
Sustainability Science for Biosphere Stewardship

Stockholm University

THE SUSTAINABLE DEVELOPMENT GOALS CENTER FOR AFRICA

Contents

INTRODUCTION

On 27th-28th June 2018, Stockholm International Water Institute (SIWI), Stockholm Resilience Centre (SRC) and the Sustainable Development Goals Center for Africa (SDGC/A), hosted the *Expert Workshop on Answering the Call for an African Water Revolution* in the Kigali Serena Hotel, Rwanda.

During the workshop, participants from governments, multilateral, bilateral and academic institutions, philanthropic foundations and the private sector, identified what it will take to scale up green water investments across Africa. Over 80 experts from 18 countries in Africa and beyond were in attendance and contributed to a lively, thought-provoking and productive 2-day workshop.

During the event, discussions focused on how to scale green water technologies, options for financing the African Water Revolution (AWR), such as a green water fund, and how best to garner the support of African leaders and the donor community for this important initiative. An important objective included planning for an AWR "High-Level Roundtable" on scaling green water investment to be held in early 2019. The workshop was the first in a series of related events throughout 2018.

The opening ceremony was officiated by Mr. Torgny Holmgren, Executive Director of SIWI; Dr. Belay Begashaw, Director General of the SDGC/A and the keynote address delivered by Mr. Jean Claude Kayisinga, Permanent Secretary, Ministry of Agriculture and Animal Resources of the Republic of Rwanda.

Workshop participants agreed, it will not be possible to reach the SDGs in Africa without an African Water Revolution, based on effective green water management. Green water is a climate-smart, cost effective and sustainable approach to enhancing community-level resilience and food security for Africa. Any new initiative must combine green and blue investments, build on existing knowledge and best practices, blend public and private financing and engage all stakeholders along the value chain. And to achieve "transformational change" in Africa, things must be done differently.

SIWI, SRC and the SDGC/A would like to thank the Swedish International Development Cooperation Agency (SIDA) for all of their support of the African Water Revolution, including for providing the funding that enabled this workshop.

"getting green water investment is absolutely essential for the development of our economies, our societies and for the planet, workshop participants must put their knowledge together and find a sustainable way for scaling-up green water investments across Africa".
Mr. Jean Claude Kayisinga, Permanent Secretary, Ministry of Agriculture and Animal Resources of the Republic of Rwanda.

BACKGROUND

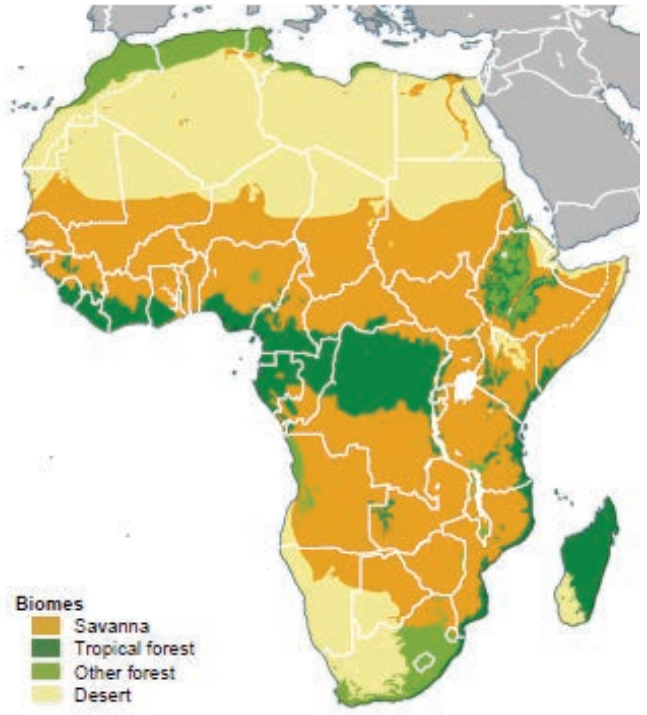
Africa faces rising water challenges due to higher demand caused by rapid population growth, urbanization, increased food demands, depletion of natural water resources and climate change.

Close to 70% of people living in Sub-Saharan Africa are engaged in rain-fed subsistence farming and face increasingly variable rainfall patterns. One-third of people across the continent are currently facing food insecurity, and there is an urgent need to solve the hunger crisis.

There is a unique opportunity to achieve water resilience based on the efficient use of green water across Sub-Saharan Africa with potential impacts on farmers and whole economies. Green water is infiltrated rainfall water which is stored in the upper layers of the soil and available to plant roots.

Proven and cost-effective solutions can maximize the capture, storage and utilization of green water in order to enhance food production and reduce vulnerability to climate variability and climate change. This represents a practical, low cost and sustainable approach for the "invisible majority" across Sub-Saharan Africa.

So why is rain-fed subsistence agriculture not being scaled up across Sub-Saharan Africa and what will it take to scale-up such solutions? What must be done differently and what are the barriers to change? Where the good practice examples and what are the key success factors? What are the existing and new sources of finance? And what leadership is required to achieve an AWR, based on green water? These are of the questions which participants debated during the two days.



Sub-Saharan Africa is dominated by tropical grasslands/savanna.
Source: Olson DM, et al (2001) Terrestrial Ecoregions of the World: A New Map of Life on Earth: A new global map of terrestrial ecoregions provides an innovative tool for conserving biodiversity. BioScience 51 (11):933-938. doi:10.1641/0006-3568(2001)051[0933:teotwa]2.0.co;2
Accessible at: https://www.worldwildlife.org/publications/terrestrial-ecoregions-of-the-world

WORKSHOP OBJECTIVES

The AWR began at the 2016 Malin Falkenmark Symposium in Stockholm during which experts called for a "revolution" to alleviate the world water and hunger crisis by scaling-up green water and enhancing rainfed agricultural solutions across Africa through financial investments and political leadership.

The Kigali workshop responded to this call to action by convening participants to identify what it takes to scale up green water investments across Africa and design a process for the AWR in advance of a High-Level Roundtable to be held in early 2019. **Annex 1** contains the list of workshop participants.

The objectives of the workshop were to:

- build a consensus that green water harvesting is a cost-efficient and tangible solution for investing in the "Invisible Majority" in Africa and necessary to achieve SDG 2: Zero Hunger, as well as contribute to the achievement of many other SDGs (e.g., SDG 3 for Health and Well Being, SDG 6 for Clean Water, and SDG 13 on Climate Action);

- receive a mandate to proceed from the broad cross-section of experts convened at the workshop, which included the Ministry of Agriculture and Animal Husbandry in Rwanda led by Honorable Gérardine Mukeshimana, Minister;

- engage assembled stakeholders and encourage continued collaboration around the initiative, including designing the financial mechanisms to scale green water technologies; and

- provide input into upcoming events such as World Water Week and the next Falkenmark Symposium, Africa Water Week and the High-Level Roundtable.

The workshop was moderated by Mr. Anton Earle, Director of the Africa Regional Centre for SIWI, and Ms. Katherine Madden, SIWI. Included as **Annex 2** is the agenda for the workshop. Detailed minutes of the workshop proceedings are included as **Annex 3**. Below is a brief summary of these proceedings, with key learnings and messages, and next steps.

Moderator Ms. Katherine Madden (SIWI), introduces particpants to the agenda for the wrokshop.

WORKSHOP SUMMARY

OPENING CEREMONY

Day 1 kicked-off with the opening ceremony during which the moderators and speakers explained the purpose of the workshop and provided a short background to the initiative and its aims.

It began with introductions and the meeting objectives: to scale up green water investments across Africa and plan for increased financing, including as one option an African Green Water Fund, with political and financial support secured from the highest levels.

Mr. Torgny Holmgren, Executive Director of SIWI

Speakers at the open ceremony were Mr. Torgny Holmgren, Executive Director of SIWI, and Dr. Belay Begashaw, Director General of the SDGC/A; a keynote address was delivered by Mr. Jean Claude Kayisinga, Permanent Secretary for the Ministry of Agriculture and Animal Resources of the Republic of Rwanda. Each gave passionate remarks about the need for the AWR.

Mr. Holmgren placed the AWR in context, highlighting the significant fresh water stress felt across the African continent. Mr. Holmgren noted that agriculture in Africa relies heavily on green water for irrigation – it is critical for the continent's food production and the livelihoods of hundreds of millions of people. He called upon workshop participants to establish a common agenda with the goal to scale clean water access for agriculture and development across the Africa continent.

Dr. Begashaw delivered a rallying call to participants. The workshop, he remarked, provides us with an opportunity to move away from "*business as usual…we must do things differently…this is my call to you today.*" He optimistically noted the financial resources for are currently available and that the Sustainable Development Goals (SDGs) have given us the mandate and a platform for action. It is now up to [us] to make the business case and think "outside the box" in terms of our strategy for financing the scale up of green water technologies. He ended, "*Our call [for an African Water Revolution] today must be louder than any call to action before*" - we have no time to wait.

Dr. Belay Begashaw, Director General of the SDGC/A

During his keynote address, Mr. Kayisinga highlighted the importance of the workshop saying that "*the mission of the Ministry of Agriculture and Animal Resources is to initiate, develop and manage suitable programs of transformation and modernization of agriculture and livestock to ensure food security and to contribute to the national economy. This mission cannot be achieved unless about 70% of Rwandan farmers engaged in rain-fed subsistence farming switch to green water use, which is already known as proven solution to fight hunger.*" He described the progress made

Mr. Jean Claude Kayisinga, Permanent Secretary for the Ministry of Agriculture and Animal Resources of the Republic of Rwanda

in Rwanda through projects designed to minimize rainwater loss and to protect the land, and remarked that green water investment is essential for the development of our economies, our societies and our planet.

Critically, the Permanent Secretary stated that the Government of Rwanda is committed to join other African countries in establishing a mandate for the AWR. SIWI, the SRC and SDGC/A are grateful for the leadership provided by The Ministry of Agriculture and Animal Resources of the Republic of Rwanda and Honorable Gérardine Mukeshimana, Minister.

H.E. Amina J. Mohammed, Deputy Secretary-General of the United Nations, sent a video message emphasizing the importance of green water for Africa, noting the tremendous challenges faced by the African continent in *"facing high-levels of water stress with very serious implications for food security."* She stated that "*scaling up green water investments could have a very important impact on ending and reversing these trends…[and] offer a practical, sustainable solution to the rural communities that form what is known as the "Invisible Majority" in Sub-Saharan Africa.*" She concluded her message by noting that to achieve the SDGs *"we must work together and reach out to new partners"* and that *"you can count on the United Nations to support Africa in accelerating the transformation we need.*"

H.E. Amina J. Mohammed, Deputy Secretary-General of the United Nations addressed participants in a video message

AFRICA'S DILEMMA AND THE POTENTIAL OF GREEN WATER

Following the opening ceremony, participants looked at the context for green water in Africa and at why we need an AWR? What is the current crisis facing Africa's "Invisible Majority" and what is the potential for green water, its role in rain-fed agriculture and how can we maximize its capture, storage and utilization?

The session began with a video presentation by Professor Malin Falkenmark, Senior Scientific Advisor at SIWI, and Professor Johan Rockström, Director of SRC. In the video they raised awareness on the current and future challenges faced by rain-fed subsistence farmers in sub-Saharan Africa.

Said Professor Rockström, *"[w]e tend to underestimate that Africa is the world's driest continent. It is the continent facing the largest frequency of droughts and dry spells."*

Professor Falkenmark stated that *"[g]iven the population pressures, the food production amongst subsistence farmers has to increase. It is urgent to modernize agriculture so that it gives food to the population."*

They drew attention to the enormous potential of green water, and the decades of experience and knowledge that already exists with small-scale farming in Africa. *"The only pathway to build agriculture systems is by managing the rainfall variability and the only way to do that is to manage green water,"* noted Professor Rockström.

Panelists discuss during the session on "why we need an AWR based on green water"

A panel of experts reflected on the key messages from the video and took part in a discussion on "why we need an AWR based on green water." The panel included Dr Ahmed K Eldaw, Regional Coordinator, Global Water Partnership; Dr. Nathaniel Matthews, Program Director, Global Resilience Partnership, and Dr. Amare Haileslassie, Senior Researcher and Head of Office for East Africa and Nile Basin, International Water Management Institute (IWMI).

The panelists noted the extremely high levels of poverty and food insecurity on the continent. Food production is too low and imports are too high. Migration, instability, conflict and unemployment exist at untenable levels.

Droughts are becoming the "new normal" as a result of climate change, combined with diseases, pests, and lack of inputs. As noted by Dr. Haileslassie, *"[farmers] are overwhelmed by the challenges."* All panelists commented, as did many participants throughout the two-day workshop, that the SDGs will not be achieved without investment in the scale-up of green water technologies across Africa. "Most of the SDGs depend on green water," stated Dr. Eldaw

"Unless we invest in agriculture, the achievement of the SDGs is unlikely... if we don't manage water, there is slim chance to achieve these Goals."
Dr. Haileslassie, Senior Researcher and Head of Office for East Africa and Nile Basin, International Water Management Institute (IWMI)

Participants recognized the need for investment in green water in order to address these challenges. Dr. Eldaw stated that we can increase productivity by focusing on green water and, noting the large number of Africans living in rainfed agrarian communities, that "[green water] is an important priority. We need to build our business case to convince donors on what we are doing. Irrigation is very costly but with a few interventions in green water, there are many positive outcomes."

Dr. Matthews commented that green water builds resilience for farmers and helps them manage risks. *"On the flip side of risk is opportunity,"* said Dr. Matthews, *"the SDGs provide us the framework to make the best of the opportunities presented…given the right support, political will and investment, farmers are eager for a revolution."*

This statement was repeated by the moderators – the AWR *"is a revolution, not an evolution."* It is about the revolutionary aspect of bringing green water technologies to scale.

BEST PRACTICES AND THE BARRIERS TO SCALING GREEN WATER SOLUTIONS

The next session explored what it will take to scale up green water solutions across Africa. Participants identified best practice examples and local, regional and global barriers to scale, including institutional, governance, coordination and behavioral issues, as well as potential levers of change.

Mr. Takuji Tanaka, Executive Technical Advisor, Rural Development Department, Japan International Cooperation Agency (JICA) leads a group discussion

Group discussions were led by three expert facilitators: Mr. Maimbo Mabanga Malesu, Programme Coordinator, World Agroforestry Centre, International Centre for Research in Agroforestry (ICRAF); Mr. Takuji Tanaka, Executive Technical Advisor, Rural Development Department, Japan International Cooperation Agency (JICA) and Mr. Desire Kagabo, Scientist, Climate Services & Farming Systems, International Centre for Tropial Agriculture (CIAT).

Led by the expert facilitators, participants noted various barriers to scale, including a lack of finance, the lack of skills and need for capacity building, and more or better research to understand the role of green water, a lack of best practice sharing and a weak business case for scaling green water technologies. To summarize a few points made by Mr. Tanaka: *"there are huge needs for green water utilization technologies" but we need to "verify the effectiveness of green water utilization technologies like water harvesting... include capacity building for extension officers and farmers...and share information about green water utilization."*

Mr. Maimbo Mabanga Malesu, Programme Coordinator, World Agroforestry Centre, International Centre for Research in Agroforestry (ICRAF) leads a group discussion

THE BUSINESS CASE FOR INVESTING IN GREEN WATER

"you cannot make a case for just one [either blue or green water], but there has to be a mix of the two." Mr. Josses Mugabi, Senior Water and Sanitation Specialist, World Bank

Mr. Len Abrams, a consultant for SIWI, presents on the case for investing in green water

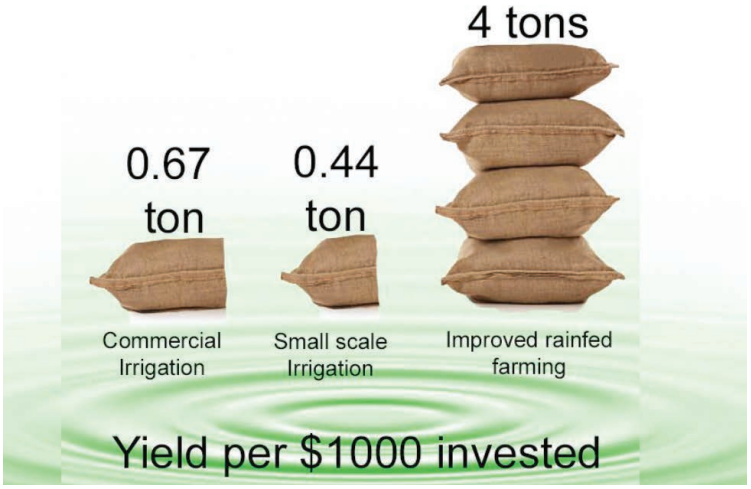
The latter half of day 1 was designed to take a deeper dive into one of the barriers to scale and the business case for scaling up green water technologies across Africa.

Mr. Len Abrams, a consultant for SIWI, gave a short presentation responding to this question including the case for public financing and integrating green and blue water investments.

Panelists then gave responses to his presentation and the draft paper African Water Revolution – Financing improved rainfed agriculture, which had been previously distributed to all participants. The panel included Mr. Yigrem Kassa, SDGs Advisor, Development Finance, for SDGC/A; Mr. Josses Mugabi, Senior Water and Sanitation Specialist at the World Bank, and Mr. Okey Daniel Ogbonnaya, Lead, Rwanda Program Coordination and Rwanda Country Program for the Global Green Growth Institute (GGGI).

Mr. Abrams made the case for increasing green water availability as key for regenerating rural economies. Green water investment ensures that water is available to farmers and thus reduces seasonal failures and catastrophic risk, allowing them to take advantage of average and good years to increase wealth, move into income generation and join the value chain.

In order to understand the potential for green water investment, Mr. Abrams (citing figures from a recent World Bank study) calculated that "yield per dollar invested in improved rainfed agriculture is potentially 9 times that of small scale irrigation and 6 times that of large scale irrigation and the land available is virtually limitless if it is recovered and restored…A 1 percent increase in productivity in rainfed agriculture would be equivalent to a 10 percent increase in irrigated agriculture in Africa."



Presentation by Mr. Len Abrams

Panelists and participant discuss during the session

Panelists and participants agreed that there is a business case for investing in green water agriculture but, as stated by Mr. Kassa, the key challenges are complex, long term and multi-faceted. "Different ways of thinking are needed," said Mr. Kassa, including innovative financing mechanisms and a robust portfolio of public and private funding.

DEVELOPING FINANCING PRINCIPLES

A number of important and common themes emerged from discussions as participants came up with 13 key funding principles for green water investing (see Annex 3 for complete list).

Critical to success is an integrated approach to green and blue water investments. In addition, any business case must consider capacity building and training costs and build upon existing knowledges and practices. We must "emphasize the importance of codifying knowledge, create a shared understanding of what works, define what "works" and define "success." And once we can document success, we can attract investment."

Participants also emphasized the need for blending public and private finance from both existing and/ or new sources. Finally, participants urged that the business case should lay out investments right along the value chain.

HOW TO START A REVOLUTION

Day 1 closed with remarks from Professor Nuhu Hatib, Regional Head for East Africa, Alliance for a Green Revolution in Africa (AGRA).

Professor Hatib summarized the key points and session outcomes, and shared some insights from the work of AGRA on enabling a green water revolution. During the remarks, Professor Hatib stated that the workshop was encouraging as it provided an opportunity for technical expertise to weigh in on the need for the AWR.

Looking forward, the group needs to show leadership and move to the action stage of implementation, stated Professor Hatib. We should be inspired by lessons learnt, he further commented, drawing inspiration from what has worked.

Professor Nuhu Hatib, Regional Head for East Africa, Alliance for a Green Revolution in Africa (AGRA) delivers the closing remarks

DEVELOPING A VISION FOR THE AWR

During Day 2 of the workshop, participants laid out a vision for success, key success factors and the various stakeholders with whom to engage going forward.

Participants discussed, debated and even drew pictures to illustrate their visions for the AWR. The visions detailed integrated blue and green water technologies, market driven approaches and investments along the entire value chain, and had at their core, concepts of inclusiveness and sustainability. All agreed that the vision of the AWR is to see the achievement of the SDGs in Africa as a result of scaled-up investment in green water.

Participants present their visions for the African Water Revolution

"Now is the time to put the big investments where the bulk of the water is, and where the enormous untapped potential is, which is innovations in green water…The solutions are there. What we need in Africa are investments throughout the whole value chain, from knowledge, skills and education, to extension services, and commercial support for farmers to be able to invest in green water systems."

Professor Johan Rockström, Director, Stockholm Resilience Center

LEARNING FROM WATER FUNDS

The second session of Day 2 looked at key success factors for delivering on the vision and began with a presentation by Eng. Philip Gichuki, Chairman of the Upper Tana- Nairobi Water Fund Board of Trustees.

As further described in **Annex 3**, the Upper Tana-Nairobi Water Fund Partnership illustrates a successful example of a public-private partnership around water conservation and "green infrastructure," addressing numerous challenges of the Tana River basin, a critical source of water for both rural people and the inhabitants of Nairobi.

IDENTIFYING KEYS FOR SUCCESS

Building on the case study example and on the experiences of participants, a number of success factors for the AWR were identified including:

- ✓ One or two "conveners" for the initiative, who would lead the efforts, bring stakeholders to gather and "champion" the cause;
- ✓ Commitment of all stakeholders involved, including importantly government;
- ✓ Build awareness among the farmers and ensure their involvement;
- ✓ Secure financial resources based on a business case for the farmers;
- ✓ Interventions should be based on farmers' actual needs and build on local knowledge, then involved financial institutions and agro-industries;
- ✓ Plan for sustainability, including capacity building and linking to markets

STAKEHOLDERS, KEY PLAYERS AND PARTNERS

The final session focused on the *WHO* - who should be part of the AWR?

Participants identified the different stakeholder groups including specific individuals and organizations that need to be engaged and potential partners, funders, champions. The various roles and responsibilities for each stakeholder group were mapped out, with a particular lens on leadership, all listed in **Annex 3** to this report.

RECOMMENDATIONS

Participants agreed that green water is a climate-smart, cost effective and sustainable approach to enhancing community-level resilience and food security in Africa, Across the various group and plenary discussion, participants made seven key recommendations on how the AWR should proceed:

Maximise the capture, storage and utilization of green water and rain-fed agriculture: this initiative must go beyond traditional rain-fed agriculture and manage rainfall variability by managing green water. Efforts must build on existing knowledge, best practices and the decades of experience within small-scale farming in Africa.

Integrate green and blue water approaches and investments: supporting green water contributes to more effective blue water management – they are not mutually exclusive. Ensure an integrated approach by promoting the opportunities of green water in conjunction with support for and use of blue water and with overall watershed management.

"All financial institutions have to make a commitment to work on resolving this issue. The political will is strong, but there is huge constraint on resources. We need to be creative in our funding strategy. We need to look at good policies and blended finance solutions to unleash the potential for water systems …We hope existing financial institutions can fine-tune their resources to work in this area…We hope all the participants today can help align their institutions' operations with this thinking…We will keep on working on these ideas and recommendations from this important meeting."

Dr. Belay Begashaw, Director General, The Sustainable Development Goals Center for Africa

Engage all stakeholders along agricultural value chains: an inclusive approach will need broad public awareness and support for green water and full engagement of local communities, local and national governments from agriculture, water and rural development and the involvement of the private sector.

Strengthen the business case for investing in green water: there is an emerging business case for greater green water investments and its role in improving water security in rural areas. Any business case must better address the complex and multi-faceted barriers including the required investment and cost, associated risk and the need for capacity building and institutional facilitation.

Develop innovative mechanisms and blended finance solutions: a comprehensive funding strategy will require innovative investment mechanisms and a robust portfolio of co-financing models with public and private funding. A key objective is long term sustainability but public finance will be needed to kick start the process.

Embed financial solutions into a broader sustainability strategy: establish context specific finance solutions that are inclusive, scalable and sustainable. This will include a supportive policy and regulatory context, knowledge, skills and education, extension services and commercial support for farmers to be able to invest in green water systems.

Leverage high level leadership and commitment: this initiative must build on existing efforts and garner high level support from political leaders. Increased understanding of the economic and social impact of the green water approach will help gain commitment from two or three countries to demonstrate leadership in this area.

NEXT STEPS AND CLOSING

During the closing plenary of the workshop, Mr. Torgny Holmgren presented some next steps for the months following the workshop:

- a report of the workshop will be sent to all participants;
- a thought leadership piece (adapted from Mr. Abrams paper) will be finalized;
- a project document will be developed to communicate how the AWR will move forward including the who/what/where/when and how for scaling and funding green water investments across Africa; and
- outreach and engagement with other stakeholders plus an advisory group and/or a "green water network" established.

SIWI, SRC and SDGCA/A aim to work with key stakeholders to design the High-Level Roundtable in early 2019. Mr. Holmgren stated that, through this workshop, a common platform has been created to forward the AWR, an institutional framework and the need for funding are crucial for success.

Mr. Holmgren further reflected on multiple events coming up in the coming six months such as World Water Week in August 2018, the AGRA African Green Revolution Forum and UN General Assembly, both in September 2018, and the Africa Water Week in October 2018. these events are stepping stones, on the way to the High-Level Roundtable for the African Water Revolution in 2019.

Heading home, participants were asked to engage with their own institutions and networks on this topic; to advocate for the need for financial interventions to support the scale-up of green water solutions; to keep the AWR abreast of their activities and engagements; and provide inputs and recommendations on the AWR initiative.

To achieve the "transformational change" in Africa, things must be done differently. A combined green-blue approach to providing water for agriculture is a climate-smart, cost effective and sustainable approach to enhancing community-level resilience and food security for Africa. Participants emphasized that already there is a great reliance on green water use on the continent with a large amount of traditional practice and knowledge built up that can form the foundation for an initiative to attract funding and investment to upscale the impact of locally-rooted technologies and practices. Finally, all also generally agreed that it will not be possible to reach the SDGs in Africa without an AWR, based on green water exploitation, building community resilience for sustainable development.

ANNEX I

LIST OF WORKSHOP PARTICIPANTS

Organization	Name	Position
African Development Bank (AfDB)	Ms. Amandine Umukesha	Water and Sanitation Expert
African Union-Semi Arid Food Grains Research and Development (AU-SAFGRAD)	Dr. Ahmed Elmekass	Coordinator
African Union-Semi Arid Food Grains Research and Development (AU-SAFGRAD)	Mr. Mure U. Agbonlahor	Resilience Economist
Alliance for a Green Revolution in Africa (AGRA)	Professor Nuhu H. Hatibu	Regional Head (Tanzania, Rwanda and Uganda)
Center for Humanitarian Affairs and Community Development (CHACODEV)	Mr. Alan C. Wei	Founding Director
Centre for Humanitarian Affairs and Community Development (CHACODEV)	Mr. Ibrahim Oluoch	Founding Director
Dabane Trust	Dr. Stephen W. Hussey	Director
Duterimbere	Mr. Fredric Rwibasira	Project Manager
East African Development Bank	Mr. David Odongo	Agriculture Head of Business
East African Development Bank	Ms. Janet Gatera	Investment Officer
Energy 4 Impact	Mr. Eric Ruzigamanzi	Project Manager for Solar Irrigation
European Union	Mr. Pascal Zahonero	Project Manager
Food & Agricultural Organization of the United Nations (FAO) - Rwanda Office	Dr. Otto Vianney Muhinda	Assistant FAO Representative, in charge of Programme
Food and Agriculture Organization of the United Nations (FAO)	Mr. Valere Nzeyimana	Land and Water Officer
Global Green Growth Institute	Mr. Okey Daniel Ogbonnaya	Lead, Rwanda Program Coordination and Rwanda Country Program
Global Resilience Partnership	Dr. Nathanial A. Matthews	Program Director

Organization	Name	Position
Global Water Partnership	Dr. Ahmed Khalid Eldaw	Regional Coordinator
Green business team	Mauzi Habasi Patrick	
Green business team	Theoniste Niyigaba	
Green Business Team Sweden AB (Rwanda)	Mr. Clovis Niyomwungere	Technical Manager, Team Rwanda
Green Business Team Sweden AB (Rwanda)	Mr. Solomon Ezenwa Adima	Head of Business Development
Green Economy Advisory & Research Ltd	Dr. Denis Rugege	Chairman
HoReCO	Mr. Emmanuel Ndayizigye	President
Initiative for Sustainable Landscapes (IDH)	Ms. Mahlet Shebabaw Bekele	Program Manager, Initiative for Sustainable Landscapes
Integrated Water Management Institute (IWMI)	Dr. Amare Hailesalassie	Irrigation Agronomist and Head of IWMI East Africa and Nile Basin
International Center for Tropical Agriculture (CIAT)	Dr. Desire M. Kagabo	Research Scientist
International Center for Tropical Agriculture (CIAT)	Mr. Maurice Rurangwa	
International Development Research Centre (IDRC)	Mrs. Edith Ofwona Adera	Senior Program Specialist
International Fund for Agricultural Development (IFAD)	Mr. Mawira Chitima	Lead Technical Specialist, Water and Rural Infrastructure
International Potato Center	Mr. Jean Claude Nshimiyimana	Senior Agronomist, Research Associate
International Union for Conservation of Nature	Dr. Alain Ndoli	Senior Program Officer
Japan International Cooperation Agency (JICA)	Mr. Jiro Makimoto	Program Advisor, JICA Rwanda
Japan International Cooperation Agency (JICA)	Mr. Jules Nzabonimana	Consultant to Irrigation Advisor
Japan International Cooperation Agency (JICA)	Mr. Takuji Tanaka	Executive Technical Advisor (Rural Development)
Japan International Cooperation Agency (JICA)	Mr. Tomoniri Nagase	Senior Representative, JICA Rwanda

Organization	Name	Position
Kenya Rainwater Association	Mr. Stephen Ngigi	Program Director
Living Water International - Rwanda	Mr. Ambaye Zekewos	Country Director
Ministry of Agriculture and Animal Resources (MINAGRI), Rwanda	Eng. Emile Ruzibiza	Head of Engineering Department
Ministry of Agriculture and Animal Resources (MINAGRI), Rwanda	Honorable Mr. Jean Claude Kayisinga	Permanent Secretary
Ministry of Agriculture and Animal Resources (MINAGRI), Rwanda	Issa Ndungutse	District Monitoring and Evaluation Officer
Ministry of Agriculture and Animal Resources (MINAGRI), Rwanda	Mr. Dan Folta	Irrigation Specialist
Ministry of Agriculture and Animal Resources (MINAGRI), Rwanda	Mr. Godfrey Kagenza	Irrigation Engineer
Ministry of Agriculture and Animal Resources (MINAGRI), Rwanda	Mr. Robert Ndabavunnye	Rural Engineer
Ministry of Agriculture and Animal Resources (MINAGRI), Rwanda	Ms. Ernestine Umuhoza	Land Husbandry Specialist
Nile Equatorial Lakes Subsidiary Action Program (NELSAP)	Eng. Elicad E. Nyabeeya	Regional Coordinator
Pro Water Rwanda Ltd	Mr. Charles Rutabariyu	Managing Director
Rwanda Agricultural and Animal Resource Development Board (RAB)	Dr. Sirikare N. Sylvere	Research Fellow in Soil and Water Management Program
SNV Netherlands Development Organization	Mr. Getachew Belaineh Tessema	WASH Sector Leader
Stockholm International Water Institute (SIWI)	Mr. Anton Earle	Director, Africa Regional Centre
Stockholm International Water Institute (SIWI)	Mr. Leonard Abrams	International Consultant
Stockholm International Water Institute (SIWI)	Mr. Torgny Holmgren	Executive Director
Stockholm International Water Institute (SIWI)	Ms. Katarina Veem	Director, Swedish Water House and International Policy
Stockholm International Water Institute (SIWI)	Ms. Katherine Madden	Project Manager, Africa Green Water Revolution

Organization	Name	Position
Stockholm International Water Institute (SIWI)	Ms. Xanani Baloyi	Programme Officer, Africa Regional Center
The Nature Conservancy, Africa Program	Mr. Eng. Philip Gichuki	Chairman, Upper Tana- Nairobi Water Fund Board of Trustees
The World Agroforestry Centre (ICRAF)	Dr. Athanase Mukuralinda	Country Representative
The World Agroforestry Centre (ICRAF)	Mr. Maimbo M. Malesu	Programme Officer - Water Management
The World Bank Group	Dr. Josses Mugabi	Senior Water and Sanitation Specialist
Three Stones International	Mr. Jesse Routte	Chief Executive Officer
UN-HABITAT	Mr. Tekalign Tsige Sahilu	Regional Technical Advisor
United Nations Economic Commission for Africa (ECA)	Ms. Daya Bragante	Blue Economy Specialist
United Nations, Rwanda	H.E. Dr. Fodé Ndiaye	UN Resident Coordinator & UNDP Resident Representative
Water Land Resource Centre (WLRC)	Dr. Tena Alamirew	Deputy Director
WaterAid Rwanda	Mr. Maurice Kwizera	Country Director
World Resources Institute	Mr. Zablon Adane	Research Analyst

ANNEX II

WORKSHOP AGENDA

WEDNESDAY 27th JUNE

Meeting moderators: Mr. Anton Earle & Ms. Katherine Madden, Stockholm International Water Institute (SIWI)

08:30 Registration

09 00 Welcome and introduction

This session will explain the purpose of the workshop and contextualise the call for an African Water Revolution by providing a short background to the initiative and its aims.

- Mr. Torgny Holmgren, Executive Director, Stockholm International Water Institute (SIWI)
- Dr. Belay Begashaw, Director General, Sustainable Development Goals Center for Africa (SDGC/A)
- Mr. Jean Claude Kayisinga, Permanent Secretary, Ministery of Agriculture and Animal Resources, Rwanda

09:30 Why do we need an African Water Revolution?

This session will highlight the current crisis facing Africa's silent majority and feature a discussion of the potential of green water, its role in rain-fed agriculture and how to maximise its capture, storage and utilisation. Followed by Q&A.

- Video presentation of Professor Malin Falkenmark, Senior Scientific Advisor, SIWI & Professor Johan Rockström, Director, Stockholm Resilience Center (SRC)
- Dr. Nathaniel Matthews, Program Director, Global Resilience Partnership
- Dr. Amare Haileslassie, Senior Researcher and Head of Office for East Africa and Nile Basin, International Water Management Institute (IWMI)
- Dr Ahmed K Eldaw, Regional Coordinator, Global Water Partnership

10:45 Coffee / Tea Break & Photo Session

11:15 Best practice and the challenge of scaling green water solutions

Group discussion led by experts to explore what it will take to scale up green water solutions across Sub-Saharan Africa. The discussion will identify best practice examples and identify local / regional / global barriers to scale including institutional, governance, coordination and behavioural issues and will identify potential levers of change.

- Mr. Maimbo Mabanga Malesu, Programme Coordinator, World Agroforestry Centre / International Centre for Research in Agroforestry (ICRAF)
- Mr. Takuji Tanaka, Executive Technical Advisor, Rural Development Department, Japan International Cooperation Agency (JICA)
- Mr. Desire Kagabo, Scientist, Climate Services & Farming Systems, International Centre for Tropial Agriculture (CIAT)

13:00 Networking lunch

14:30 Financing change

This session will begin with a short presentation on what it will take to scale up green water investments across Africa including the case for public financing and integrating green and blue water investments. Different voices from the financial community will give responses to the paper (African Water Revolution – Financing improved rainfed agriculture) highlighting perspectives, challenges and opportunities.

- Mr. Len Abrams, Consultant, Stockholm International Water Institute (SIWI)
- Mr. Yigrem Kassa, SDGs Advisor, Development Finance, The Sustainable Development Goals Center for Africa (SDGC/A)
- Mr. Josses Mugabi, Senior Water and Sanitation Specialist, World Bank
- Mr. Okey Daniel Ogbonnaya, Lead, Rwanda Program Coordination and Rwanda Country Program, Global Green Growth Institute (GGGI)

15:45 Coffee/Tea Break

16:15 Designing a financial mechanism

In groups, participants will discuss which financial approaches would be most appropriate to scale up green water solutions. This will include identifying potential sources of financing (redirecting existing sources and possible new sources) and the key steps involved in setting up such a mechanism. Key questions for discussion include:

- What is the purpose of the Fund?
- What are the potential sources of finance?
- What are the key features of such a Fund?

17:45 Closing Remarks

Summary of the day's proceedings and meeting wrap-up.

- Professor Nuhu Hatibu, Regional Head for East Africa, Alliance for a Green Revolution in Africa (AGRA)

18:00 Reception at Serena Hotel, Poolside Terrace

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THURSDAY 28TH JUNE

08:30 Vision

This plenary and group session will draw together discussions and set out a vision for an African Water Revolution to achieve water resilience based on the efficient use of green water across sub-Saharan Africa.

09:30 Key success factors

There will be a short presentation of the Africa Water Funds Partnership, a partnership in Nairobi to fund upstream water conservation which replicates the work of the Latin America Water Funds Partnership. Building on this example and the experience of participants, the presentation will be followed by group work to identify the key success factors for the African Water Revolution.

- Eng . Philip Gichuki, Africa Water Funds Partnership

11:00 Coffee / Tea Break

11:30 Stakeholders, key players and partners

This session will focus on who should be part of the African Water Revolution. In plenary, participants will identify the different stakeholder groups, specific individuals and organisations that need to be engaged and who might be the potential partners / funders / champions. Participants will then work in groups to map out the various roles and responsibilities for stakeholders at different levels. There will be a particular focus on leadership.

12:30 From Vision to Reality

This final plenary session will move from design to action. There will be a short presentation summarising the findings from the workshop before a discussion on how this initiative will move forward. Topics include upcoming meetings (WWW, UNGA, Africa Water Week), high level roundtable in January 2019, accountability, funding, leadership and partnerships. Final insights will be shared by African Water Revolution partners, SIWI and SDGC/A.

- Dr. Belay Begashaw, Director General, Sustainable Development Goals Center for Africa (SDGC/A)
- Mr. Torgny Holmgren, Executive Director, Stockholm International Water (SIWI)

13:30 Lunch

13:45 Optional field visit (Box lunches will be provided for those attending)

For participants who are interested and available, we will visit the Rwamagana 34 site, part of the Government of Rwanda's Land Husbandry, Water harvesting and Hillside irrigation project, approximately 1 hour drive from Kigali. The project uses a combination of techniques and technologies in the construction and management of the land (e.g., soil bunds, terraces, waterways, afforestation and reforestation), developing land husbandry practices for both rain-fed and irrigated hillside agriculture. We aim to return to Kigali by 17:30.

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ANNEX III

DETAILED WORKSHOP PROCEEDINGS

Summarized in this Annex 3 is a detailed account of the sessions that took place during the Expert Workshop. The workshop was not recorded and this overview therefore reflects notes taken by the organizers. Efforts have been made to accurately reflect what was said and therefore some quotes may not be verbatim. As a result, other than speakers and panelists, the organizers have chosen not to attribute other quotes mentioned below to any specific individual.

OPENING CEREMONY

Day 1 of the expert workshop kicked-off with an opening ceremony during which the moderators and speakers explained the purpose of the workshop and contextualized the call for an AWR, based on green water, by providing a short background to the initiative and its aims.

The ceremony began with introductions and the overview of the objectives to scale up green water investments across Africa and plan for increased financing, including as one option an African Green Water Fund, with political and financial support secured from the highest levels. Then the opening ceremony speakers gave passionate remarks about the need for the AWR.

During his opening statement, Mr. Torgny Holmgren, Executive Director of SIWI, highlighted that by 2050 the amount of fresh water required throughout the world will be 50% above that of the beginning of this century, with areas from Cape Town to China to California to the Sahara all facing limited water resources. This is a global issue, but with the greatest stress felt across Africa:

"Africa is the continent facing the largest clean water problem in the world. Over the past years we [SIWI] have looked at how we can gather and manage this resource for the world." That has led to this call for the African Water Revolution, and the need to bring experts together at this workshop.

Mr. Holmgren noted that agriculture in Africa (and throughout the world) relies on green water for irrigation – it is imperative for production. He concluded by asking the workshop participants to establish a common agenda with the goal to scale clean water access for agriculture and development across the Africa continent.

Dr. Belay Begashaw, Director General of the SDGC/A, welcomed participants. Dr. Begashaw remarked that the workshop provides us with an opportunity to move away from *"business as usual…we must do things differently…this is my call to you today."*

Dr. Begashaw continued, *"We all understand the importance of water. When we talk about green water we are talking about basic human existence. But in Africa farmers are struggling to meet even one harvest per year. Droughts are no longer unusual, they are the norm."*

"So how do we capitalize on this opportunity before us today and achieve the SDGs? How can we create change? In climate, in hunger and so forth? The SDG Agenda 2030 has given us clear targets and goals, a clarity of purpose and a development platform. The SDGs have empowered us and now we must expedite our work but with consideration for the three pillars of economic growth, inclusiveness and environmental sustainability…We need to think differently...we need a different financial trajectory in order to scale existing technologies on green water. We have to bring inclusive economic growth. It has to be environmentally sustainable."

He concluded his remarks with an optimistic note on financing. The resources are there in the world. For instance, if the world's billionaires would give just 1% of their net worth to the SDGs, that would amount to $91 billion and close a large financing gap in current development assistance to Low-Income and Low-Middle Income Countries. There are efforts underway to secure these commitments. Our fundraising must change, as must our decision-making processes. He ended, *"Our call [for an AWR] today must be louder than any call to action before."* We have no time to wait.

Dr. Begashaw then introduced and welcomed Mr. Jean Claude Kayisinga, Permanent Secretary for the Ministry of Agriculture and Animal Resources of the Republic of Rwanda, who delivered the key note address and officially opened the workshop.

Mr. Kayisinga thanked SDGC/A, SIWI and SRC for organizing such an important workshop and bringing together senior experts from all over the world to discuss how to achieve water resilience based on the efficient use of green water. Mr. Kayisinga noted that the *"mission of the Ministry of Agriculture and Animal Resources is to initiate, develop and manage suitable programs of transformation and modernization of agriculture and livestock to ensure food security and to contribute to the national economy. This mission cannot be achieved unless about 70% of Rwandan farmers engaged in rain-fed subsistence farming switch to green water use, which is already known as proven solution to fight hunger."*

He noted that the Ministry of Agriculture is responding to the SDGs, and in particular SDG 2: Zero Hunger, through projects designed to minimize rainwater loss and to protect land. Tremendous progress has been made in Rwanda in terms of land husbandry and water harvesting, as is evident in the Rwamagana-34 site in Rwamagana District of Eastern Province, which workshop participants had the opportunity to visit in the afternoon of Day 2. The Permanent Secretary stated that *"the site is developed with comprehensive land husbandry technologies in a rain-fed area of 1,089 ha and an irrigated area of 267 ha that is being served by dam of 1,000,000 cubic meters. In this site, land-husbandry technologies including terracing, tree nursery preparation, and agroforestry, are contributing to water retention capacity, biomass increase, transforming marginalized land into productive land, with job creation and fodder production on the embankment."*

Mr. Kayisinga noted that the success of these initiatives needs to be accompanied by capacity building efforts. He cited again as an example Rwamagana 34, where farmers have been organized into cooperatives and self-help groups, have been trained on good agronomic practices, have secured supply contracts with local companies and have obtained access to financial services such as input financing, targeted savings, inventory credits among other financial products.

Importantly, the Permanent Secretary stated that the Government of Rwanda is committed to join other African countries in establishing a mandate for the African Water Revolution.

He remarked that getting green water investment is absolutely essential for the development of our economies, our societies and for the planet. Lastly, the Permanent Secretary called for participants to put their knowledge together and find a sustainable way for scaling-up green water investments across Africa.

In closing, the moderators applauded the powerful call to action given by Mr. Holmgren, Dr. Begashaw and Permanent Secretary Kayisinga. They asked participants to explore the problems of scaling up green water, how to leverage the good practices already in existence, and how to build the business case and attract financing for green water development in Africa. The moderators also urged, as was done by Dr. Begashaw, for participants to think about how to "*do things differently*."

DAY 1

Session 1: Why do we need an African Water Revolution?

The first session of Day 1 focused on "the WHY." Why do we need an AWR? What is the current crisis facing Africa's "Invisible Majority" and what is the potential for green water, its role in rain-fed agriculture and how can we maximize its capture, storage and utilization? And why now?

The session began with a video presentation by Professor Malin Falkenmark, Senior Scientific Advisor at SIWI and Professor Johan Rockström, Director of SRC. In the video they raised awareness on the current and future challenges faced by rain-fed subsistence farmers in sub-Saharan Africa:

"We tend to underestimate that Africa is the world's driest continent. It is the continent facing the largest frequency of droughts and dry spells." - Professor Rockström

"Given the population pressures, the food production amongst subsistence farmers has to increase. It is urgent to modernize agriculture so that it gives food to the population." - Professor Falkenmark

They drew attention to the enormous potential of green water, and the decades of experience and knowledge that already exists with small-scale farming in Africa:

"The only pathway to build agriculture systems is by managing the rainfall variability and the only way to do that is to manage green water." - Professor Rockström

And they made an urgent call for an African Water Revolution:

"Now is the time to put the big investments where the bulk of the water is, and where the enormous untapped potential is, which is innovations in green water…The solutions are there. What we need in Africa are investments throughout the whole value chain, from knowledge, skills and education, to extension services, and commercial support for farmers to be able to invest in green water systems." - Professor Rockström

Following the video presentation, a panel of experts took a deeper dive into the question of "why we need an AWR based on green water." The panel discussion was led by moderator Mr. Anton Earle, and included Dr Ahmed K Eldaw, Regional Coordinator, Global Water Partnership; Dr. Nathaniel Matthews, Program Director, Global Resilience Partnership, and Dr. Amare Haileslassie, Senior Researcher and Head of Office for East Africa and Nile Basin, International Water Management Institute (IWMI).

Opening the discussion, Dr. Eldaw stated that investment in blue water has been easier to market and centers around large infrastructure. *"Investment in green water needs a paradigm shift."* There are issues of economies of scale with green water investment. What is needed is a clear "package" to attract investments along the entire value chain from farm to market. Extension services and better use of technology must be addressed. Dr. Eldaw stressed that green water has to be integrated into overall watershed management, and agriculture must be viewed as being about "more than crops."

Regarding the policy environment, Dr. Eldaw stated that *"we need to enforce policies. The leadership we need is there. If this goes to the African Union, we will be able to have a mandate. We have a good commitment at the high level and we need to take an integrated approach."*

In terms of "why Africa", it is evident that the level of poverty and food security on the continent is of great concern, noted Dr. Eldaw *"Most of the SDGs depend on green water,"* he stated. Migration and employment issues are also linked with green water. The financial requirement, he believed, is nominal in order to really scale this issue.

Continuing the discussion Dr. Nathaniel Matthews began his remarks by noting that food production in

Africa is still low and a majority of the food on the continent comes through imports – and in addition this frequency is increasing. Green water builds resilience. *"We are hearing from farmers more and more that drought is happening more frequently. Green water helps us manage those risks and to transform in the face of change. The solutions are already there, home grown in Africa" h*e stated. Dr. Matthews highlighted that the green water concepts are relatively simple, for instance by "opening up the soil to capture more moisture or using conservation tillage," but what is missing is the financing we need to do this.

Dr. Matthews described two countries, Rwanda and Tanzania, as "shining stars" in leading the way on green water approaches and that we should leverage on the potential of these countries for the AWR. Dr. Matthews stated that leadership needs to show commitment at the top, but from a bottom-up approach, farmers need to be informed on the beneficial values of green water as they will not adapt unless they see it being successful. *"Green water can help with inclusiveness. Leadership needs to consider building capacity of farmers within the value chain."* he stated. Stressing that Africa is on the cusp of a crises, Dr. Matthews ended his opening comments with:

"on the flip side of risk is opportunity...
the SDGs now provide us the framework to make the best of the opportunities presented...
given the right support, political will and investment, farmers are eager for a revolution."

Dr. Amare Haileslassie continued by describing all of the challenges faced by African agriculture – drought, soil depletion, diseases, lack of inputs, population growth, to name a few. *"Farmers are generally risk averse but they are overwhelmed by the challenges...they have become risk managers,"* Dr. Haileslassie stressed. He went on that we must consider all of these issues in order to close the yield gap, or we will be faced with disastrous situations. But he said we have the technologies, we just need to make the best of them and transfer knowledge and best practices, especially from Asia. *"We need to identify these technologies and knowledge and capitalize on them."* Dr. Haileslassie further commented that we need to address landscape perspectives, both in terms of "water extraction" and "water effectiveness," but that *"green water management does not mean we that we do not invest in blue water; they are not mutually exclusive, in fact they feed into one another. Green water management is essential, it sustainably contributes towards investment in blue water."* He ended his comments by noting that political leadership and finance are key:

"Unless we invest in agriculture, the achievement of the SDGs is unlikely...If we don't manage water, there is slim opportunity to achieve these Goals."

Following the panel, participants spent a few minutes at their tables and in a few words listed out their reasons for "Why" an AWR. Common words that arose were **food insecurity, climate change, population pressure, small window and cusp of a crisis.**

And words of hope offered by participants included **great potential, ecosystems resilience, technology transfer, low cost, efficient** and **we know it works!**

Coming back to the group a few important points were stressed:

- ***Comprehensive approach:*** we cannot talk about green water alone, but we need an integrated strategy, addressing blue water as well. As one participant noted, green water has to be intensively promoted with other existing methods of agricultural production; integrated farming is key to addressing the economic and social impact of using green water;
- ***Technology and knowledge transfer:*** we also must think about an integrated package of interventions including technology and ICT, capacity building, agriculture advisory services, even having the weather forecast localized for the farmer – all must be part of an "AWR;"
- ***Support disruptive thinking:*** there is a need for high level support of "disruptive thinkers" - people who already have solutions, and these solutions should be local first, before we try to "import" them from abroad;
- ***Bring the leaders along:*** our political leaders need to understand the economic and social impact of the green water approach;

- ***One African voice:*** Africa needs to speak on climate change and water stress issues with "one voice" and the African Union can contribute to this "one voice" concept; and
- ***Time is now:*** the window to address these challenges and to transform subsistence farming to large scale is right now with the SDGs.

The session then concluded with summary points by the panelists:

Dr. Haileslassie noted that we have to be conscious to not repeat mistakes when we capture knowledge and skills. "*Green water management is not just about capturing water. It is ensuring that it is captured in the biomass. We need alternative fertilizer inputs and there is a need for timing combined as a package which will make the green water revolution more effective"* he stated. He also agreed with the participant discussion in that a green water initiative does not mean that we should not invest in blue water – *"Green water management automatically triggers blue water management. Green water management reduces pressure on blue water."*

Dr. Matthews highlighted that leadership is needed at all levels. We need political leadership from the top as well as from farmers and the community. In addition, he noted again that farmers will not adopt new practices without seeing their success work on other farms. "*If we can get leadership from the top and from the farmers, then we'll see change. Many farms are left to be managed by women. This leadership can help with inclusiveness. Leadership across the value chain is critical"* he stated. Dr. Matthews stated that now is the time to address this because he believes we do have political will, we have a strong private sector, we have enterprising farmers, and we have a global agenda with the SDGs and the Paris Agreement. *"Let's ensure that we don't wait for the next crisis,"* he ended.

Dr. Eldaw stated that we can focus on productivity by focusing on green water. When addressing why Africa, he stated that because of the level of poverty, population, climate change, food scarcity, migration, jobs and employment. *"30% of Africans live in rainfed agrarian communities. It's an important priority. We need to build our business case to convince donors on what we are doing. Irrigation is very costly but with a few interventions in green water, there are many positive outcomes,"* Dr. Eldaw noted.

The moderator ended by re-iterating a statement from participants:"*this is a revolution not an evolution."* This is about a revolutionary aspect of bringing things to scale.

Three breakout groups were led by expert facilitators: Mr. Maimbo Mabanga Malesu, Programme Coordi-

Session 2: Best practice and the challenge of scaling green water solutions

This next session of the day began with group discussion led by experts to explore what it will take to scale up green water solutions across Sub-Saharan Africa. The session was meant for participants to identify best practice examples and local, regional and global barriers to scale, including institutional, governance, coordination and behavioral issues, as well as potential levers of change.

nator, World Agroforestry Centre, International Centre for Research in Agroforestry (ICRAF); Mr. Takuji Tanaka, Executive Technical Advisor, Rural Development Department, Japan International Cooperation Agency (JICA) and Mr. Desire Kagabo, Scientist, Climate Services & Farming Systems, International Centre for Tropial Agriculture (CIAT).

Each of the group facilitators made summary introductory remarks before the group discussions. The issue of **financing** was clearly described by many participants as a notable barrier for scale. Another important point was the for more research on the existing systems and technologies in order to assess their impact at household level for building up the business case in order to finance the scaling-up of such systems and technologies.

Mr. Tanaka made an opening presentation to his break-out group on various techniques used for green water utilization, focusing on five types of systems: (i) within field, (ii) flood or gully, (iii) rill or sheet flow, (iv) sub-surface or ground and (v) roof water harvesting. He discussed two key elements, capture and storage, in terms of runoff scale, storage medium and time scale. Mr. Tanaka also discussed JICA's green water projects in Oromia, Ethiopia, Ngoma, Rwanda and the Sahel Oasis area of Niger, as well as the African Initiative for Combating Desertification launched during TICAD VI in 2016. He finished with a brief summary of good integrated water management practices in Japan.

Mr. Tanaka's presentation stated in conclusion that *"there are huge needs for green water utilization technologies"* and we should "*(1) verify the effectiveness of green water utilization technologies like water harvesting, (2) take a comprehensive approach for green water utilization including not only construction of facilities but also farming technologies (i.e., fertilizer, seed, etc), (3) include capacity building for extension officers and farmers, (4) develop a network of African countries regarding green water utilization and (5) share information about green water utilization."*

In his opening remarks to his breakout group, Mr. Malesu's stated that management of green water is important because of the rapid population growth and competing demands for water. However, although there is variability in rainfall, the volume of water is high enough for the population growth. For example, in Kenya, the amount of rainfall is enough for five times of its current population. He went on to discuss land management and use – "those countries that have managed their trees well are the richest" Mr. Malesu claimed. Removal of vegetation is an issue, and agroforestry is necessary while trees are being regenerated. Trees, shrubs and grass are important as they "will absorb about 30-40% of the rain." However, more research is necessary on the relationship between vegetation cover and rainfall. Finally, he noted that the issue of land use is critical and that some of the practices that have been introduced in Africa, such as machine ploughing, are not suitable.

Mr. Malesu then walked through some best practice examples around Africa:

- **Kenya:** Example of a project for harvesting of run-off water through farm ponds for irrigation. Mr. Malesu referenced a project called The Billion Dollar Business Alliance for Scaling-up Rainwater Management that is addressing the challenges of small scale irrigation by bringing together different stakeholders, including technical and financial institutions, to develop on-farm water management practices. The project is assuring farmers of more stable outputs to enable them to take credit from banks. The program includes full or partial recovery of investment and uses a value chain

approach.

- **Ethiopia:** Another example cited in the Tigray region of Ethiopia that is using a watershed management approach and technologies like GIS mapping to turn degraded land into productive land. In addition, the project involves community participation with a safety net program and a mandatory 30 days' work contribution by each farmer to the initiative. The community mobilization helped changed mindsets from the top to the local level. Leaders now understand that you cannot improve agriculture without soil and water management, while the community sees benefits from increased productivity.

- **Rwanda:** Comprehensive hillside management approaches are being deployed. In addition to afforestation and agroforestry practices, other mechanical measures such as hillside terracing and well drained systems are used.

- **Burkina Faso.** A program that significantly increased crop yields through green water management was mentioned.

Lastly, Mr. Kagabo's group focused on issues of financing, protection of the land, need for a coordination unit (a working group to bring together different partners), governance and building a conducive environment, knowledge and skills, sharing challenges and solutions, and knowledge sharing. Participants noted several challenges including lack of system accountability, low level of information on the appropriate technologies according to local needs, and need for better prioritizing.

Overall the participants came up with categories and list of various barriers to scaling green water technologies, noted on the following page. And, in conclusion, the moderators highlighted three key themes for areas of focus as being **financing, capacity building and research**

BARRIERS TO SCALING GREEN WATER TECHNOLOGIES AS IDENTIFIED BY WORKSHOP PARTICIPANTS

FINANCE	GOVERNANCE:
• Poor business case • Public sector participation needed • Public funding linked with specific groups of farmers • Lack of insurance for farmers • Lack of incentives • Inadequate cost recovery • Investment is dedicated to commercial projects • Need an integrated agricultural management approach, linking green and blue water in order to tap into the markets • Investment recovery needs to link conservation with irrigation • Investment must consider ownership and sustainability; be prepared for when outside funding ends •	• Lack of political commitment • Lack of national frameworks for land use policies (note – African land policy framework that can be leveraged elsewhere) & water management • Poor institutional capacity • Poor regulations • Need to include green water management into national investment plans • Lack of partnership policies between government and private sector • Inadequate integrated approach • Lack of holistic approach • Lack of harmonization of policies • Institutional fragmentation • No synergies between land use, and economic and social activities • Need strong community / collective approach
LAND TENURE:	KNOWLEDGE:
• Small land size • Poor access to land • Better land use and planning needed • Rural settlement patterns (e.g., scattered) • Need mechanisms to reach individual farmers	• Class of traditional and modern practices – need to better understand what to keep in terms of indigenous knowledge and what to adapt • Challenges to modifying existing farming and water use practices include lack of right seed varieties and improved pastures and grasses; continued use of ox and plough • Often there is a lack of awareness or the requisite knowledge • Need mind-set change • Community rejection occurs
SKILLS / CAPACITY:	RESEARCH:
• Lack of training • Weak capacity building around green water projects • Link to markets; focus on the business side	• Understanding role of trees and vegetation • Lack of centralized database • Lack of lessons learned on what has been "tried & tested" • Lack of evidence / "verifiable value" created, for example on the role of vegetation • Unpredictable climate
TECHNOLOGY:	GLOBAL ORDER:
• Limited adapted technologies • Some methods not suitable for Africa • Need better post-harvest technologies	• Vested interest to import food to Africa by EU, US, etc. • Imposed practices

Session 3: Financing change

This session was designed to take a deep dive into one of the barriers to scale – the need for increased financing in order to scale up green water technologies across Africa.

It began with a short presentation by Mr. Len Abrams, a consultant for SIWI, on what it will take to scale up green water investments across Africa including the case for public financing and integrating green and blue water investments. Panelist then gave responses to his presentation and the draft paper *African Water Revolution – Financing improved rainfed agriculture,* which had been previously distributed to all participants, highlighting perspectives, challenges and opportunities. The panel included Mr. Yigrem Kassa, SDGs Advisor, Development Finance, for SDGC/A; Mr. Josses Mugabi, Senior Water and Sanitation Specialist at the World Bank, and Mr. Okey Daniel Ogbonnaya, Lead, Rwanda Program Coordination and Rwanda Country Program for the Global Green Growth Institute (GGGI).

During the opening discussion the moderator, Mr. Anton Earle, asked participants if they believed there is a business case for green water revolution?

Mr. Earle then noted that he believes that there is a clear business case for investing in green water but it has not clearly been articulated by stakeholders yet. Private capital is not frequently flowing into green water investments. This is a social business case, he stated; there could be good business benefits but only a small, family-based scale. As a result, private capital must be publicly leveraged in some way. Mr. Earle said that useful example would be considering other processes that balance the environment with fighting poverty; there is a close relationship between environmental issues and development.

Participants then re-iterated that there is expanded need for green water and that financing of it was crucial given Africa's growing population. "*Water is a social good that needs concessional financing,"* one participant noted. However, participants also recognized that it has been difficult to define the business case due to lack of common understanding of the technical and financial terms.

Mr. Abrams presented the draft paper "*African Water Revolution – Financing improved rainfed agriculture,"* which had been distributed to all participants to review prior to the workshop. Some interesting summary slides and related points to note from Mr. Abrams presentation as he began to outline the business case for green water investment are included as Annex 3A.

After laying out the complex, multi-faceted reasons behind the difficulties faced by rural populations in all countries in Africa and the resulting consequences, Mr. Abrams made the case for increasing green water availability as key for regenerating rural economies. Green water investment ensures that water is available to farmers and thus reduces seasonal failures and catastrophic risk, allowing them to take advantage of average and good years to increase wealth, move into income generation and join the value chain. Green water investment "releases human capital into the wider economy."

In order to understand the potential for green water investment, Mr. Abrams (citing figures from a recent World Bank study) calculated that "yield per dollar invested in improved rainfed agriculture is potentially 9 times that of small scale irrigation and 6 times that of large scale irrigation and the land available is virtually limitless if it is recovered and restored. A 1 percent increase in productivity in rainfed agriculture would be equivalent to a 10 percent increase in irrigated agriculture in Africa."

How can this be done at scale? This is is a multi-faceted challenge that needs:

- an actively supportive political context;
- the full engagement of the public sector;
- enabling private enterprises and business initiatives;
- broad public awareness and support, particularly in rural areas;
- an inclusive context involving a wide range of stakeholders; and
- the engagement of external support from governments (e.g., rural regeneration policy, sector

integration, technical assistance, credit & grant financing) and others on research and analysis and advocacy.

Mr. Abrams stated that the public sector needs to lead in financing the scaling-up of rainfed agriculture, with support from international development agencies (multilateral and bilateral institutions) and, where possible, the private sector. He advocated for commercial financing then of large-scale commercial (blue) irrigation. Financing sources for scaling green water investments may include:

- Redirection of current expenditures, such as drought disaster funding, emergency
- feeding, food import funding, payment for environment services;
- Redirection of blue water investments from multilateral and bilateral sources;
- Existing climate funds; and
- New sources of finances such as a Green Water Fund.

The session continued with a panel during which the panelists addressed the issues discussed in Mr. Abram's presentation and provided their own recommendations.

Mr. Yigrem Kassa agreed that there is a strong business case for investing in green water agriculture and that the key challenges are complex, long term and multi-faceted. Thus, *"different ways of thinking are needed."* He noted that it is important to have a clear identification of the investment need with cost estimations; he recommended developing a "results-based management framework" that takes account of the benefits to farmers and communities and contribution to sustainability. A root question should always be *"how is this going to directly benefit residents?"* and we should think of a market that *"works for the people."* Innovative financing mechanisms will be needed and any funding strategy should include a robust portfolio of public and private funding, as well as self-financing. He ended by stating we should engage local communities, local governments and the private sector.

Mr. Mugabi noted that the World Bank has been working on "green water" for "a long time" and that in his experience, noting an example of the Bank's work in Malawi, a large share of costs goes to capacity building and institutional facilitation. These costs should also be related to the business plan for green water investments. As many participants mentioned, Mr. Mugabi believed we should have a mix of green and blue water investments, and based on scientific research. He stated that *"you can't make a case for just one, there has to be a mix of the two, which is politically supported."* The narrative, especially in order to best engage with governments, is very important. Green water investments are not "visible" but blue water investment is "visible", so the narrative must be very clear on the importance of green water.

Finally, Mr. Ogbonnaya stated that we should not consider solely a long-term generational view, which can tend to take away from the urgency of the matter, but that we should look at the immediate needs of small holder farms. Then we need a more long-term strategy at the policy level. He went on to highlight the need for a mix of portfolios and to be context-specific (e.g., to East Africa, West Africa, etc.). Finally, he stated that the business case must include codifying knowledge and existing practices in green water use and investment in order to make a more compelling case.

Following the panel discussions, Dr. Belay Begashaw, Director General of the SDGC/A remarked that:

"It is very encouraging to hear the innovative discussions this afternoon and see that there is some business case in green water investment. We have no other option really -- hundreds of millions of farmers do not have sufficient rainfall on their farm land. This is a lifesaving strategy. We either continue importing the food or we have sustainable agriculture in Africa. This is not just about economics or financing. We can and should invest in green water. Our financial institutions must have serious and inclusive investment to help us with this only real option for sustainable agriculture."

Session 4: Designing a financial mechanism

The final session of the day was moderated by Mr. Anton Earle and Ms. Katherine Madden and continued with commentary on the presentation by Mr. Abrams in the previous session.

In addition, participants discussed thoughts on key funding principles to incorporate into any green water investment. These were then finalized at the beginning of Day 2 (see below under Day 2). Some interesting commentary from the group session is included below.

- Participants continued to call for "a sensible blend of green and blue water" and an "integrated approach," but agreed on the need and the potential for green water scale-up. They also stated that more analysis is needed to understand what it will take to bring green water to scale:
    - "Investment for smallholder farmers has increased over the years."
    - "More investment is required for green water, because it is more effective in terms of yield per unit investment."
    - "Why have we not scaled up green water investment? There is a lot of room for investment and a lot of funding available from donors. But we have not scaled up. A political economy analysis is needed to understand this."

- Discussions focused on the definitions of green and blue water:
    - "there are different definitions for green and blue water. Definitions can be made for technical or practical purposes. The goal of my paper is to have a definition that suits sustainable agriculture for smallholder farmers."
    - "as of today, the farmer still relies on rainfall. But part of the green water principle is to be able to reliably store and capture that rainfall."
    - "green water is about sustainable water usage and increase in agriculture production."
    - "green water is about moisture management."
    - "Many initiatives do not differentiate green or blue water. The focus should be on smallholder farmers' water security, which is mostly about in-situ rain water management."

- Further comments were made on building the business case:
    - "It needs to show impact and have a clear business plan."
    - "Risk is a very important component. If you cannot openly and actively tackle risk, and research the risk involved, you will not be able to get sufficient financing."
    - "Emphasize the importance of codifying knowledge, create a shared understanding of what works, define what "works" and define "success" And once we can document success, we can attract investment."
    - "Pilot projects should be documented, as should indigenous knowledge."
    - "We need a clear delineation of what is a development initiative, including internal investment and overhead, and another component that is fee-based, or income-generating. If that is your foundation, then you can be better at getting commercial financers more interested. As is, it is attractive to social, development financing. But it is not attractive for commercial fiinancing."
    - "One element we need to look at is investment and yield. Africa is spending $5 bn / year for importing food. Poor people cannot afford this. People are looking for lowest possible cost options for food. We must also include operating expenditures in the cost calculations. Seed quality and other factors must be considered in the cost of production of food. We should look at the combination of tools available for efficient food production. Solar pumps, dams, and other types of technologies should all be considered."
    - Costs must be better analyzed, including costs for capacity building and the importance of training farmers.
    - "Environment and social mitigation strategies have to be clear in any investment."

- And on the types of financing:
  - "we are looking at water projects that can go forward on a commercial basis, as opposed to most, which are concessionary financing. Sometimes split one project into both a commercial and a social component: commercial financing in a dam, social investment (grant) in the community around the dam. This is the magic of blended finance."
  - "Public finance should kick start the process to lift farmer out of poverty trap."
  - "Learn from blue water investing and use co-financing models."
  - "There are several new water initiatives supported by UN Water, the World Bank and EIB that we should partner with."
  - "There might be opportunities with the Green Climate Fund, as it does not appear to have invested in green water, or other climate financing projects which remain very high level. This is a good opportunity to call for a mix of agriculture investment, or water investment, and to create the larger scale of investment that is needed."

- There was clear consensus on the need for support from government and communities:
  - "Put governments at the center stage and do not have a donor dependent mindset. Communities and government should be in the driver seat."
  - "Any pilot project should be included in a government plan so that its already institutionalized. This will make sure it does not feel like an additional project or a standalone work. The projects need to be embedded so that they are naturally picked it up. We need 1 or 2 countries who will try this out."
  - "We need to consider joint planning from the beginning at the grassroots level, high level, stakeholder engagement and partnerships."
  - "Embeddedness" – projects must fit within local and national plans; ensures an element of continuity.

- Near the end, one participant tried to bring it all together by stating the following: "the bottom line is sustainability - economic, environmental and social. Then, there should be the combination of the tools available. The time scale should be defined. Then we can have consensus on building a business case."

Closing Remarks

Day 1 closed with remarks from Professor Nuhu Hatib, Regional Head for East Africa, Alliance for a Green Revolution in Africa (AGRA). Professor Hatib summarized the key points and session outcomes, and shared some insights from the work of AGRA on enabling a green water revolution.

During the remarks, Professor Hatib stated that the workshop was encouraging as it provided an opportunity for technical expertise. But, he went on, the group needs to "move beyond definitions;" this group should provide leadership and move to the action stage of implementation. Professor Hatib stressed that participants need to be clear about the management and utilization of green water; we should not be paralyzed by failures but be inspired by lessons learnt, drawing inspiration from what has worked, and discarding what has not worked.

Professor Hatib summarized that important areas of focus include: (i) establishing a market driven initiative that is sustainable, in which poverty is reduced by good return to yield; (ii) in areas of finance, insure risk and leverage the private sector; (iii) regarding ergonomics, we must look at how people are using the soil which directly gets the rain. Professor Hatib noted that one area that was not discussed much by the participants but should be considered was energy and the use of solar power.

Day 1 then concluded with a cocktail reception during which all the participants could mingle and converse more about the days' proceedings.

DAY 2

Session 1: Vision

The second day of the workshop was focused on "making the AWR a reality." What is the vision, key success factors and various stakeholders (and their roles) that are necessary to carry the AWR forward?

The opening group session began with a recap of discussions from the first day of the workshop and the day was again moderated by Mr. Anton Earle and Ms. Katherine Madden from SIWI.

During the opening plenary, it was stated that "*rainfed agriculture deals with small-scale farmers, almost at the individual level, and funding these systems requires a new way of thinking and design.*" Again the integration of green and blue water was brought up: *"green water and blue water must be thought of as a continuum and they are not mutually exclusive."* Regarding the financial design, it was noted that we need to clearly define which components can be commercialized and bankable: *"it is possible to have a blended finance design, as long as there are guidelines and a clear delineation of which components of the project can be financed by the private sector."*

One participant stated that "*more investment is needed to make farmers more resilient and have stable income over adverse weather conditions. We need to make markets work for the poor. We need to work with all the actors including government and the private sector to overcome policy and regulatory constraints in order to arrive at a market system that benefits the least advantaged."*

After the opening plenary, the moderators showed a draft version of Funding Principles for Green Water Investment – key principles that the moderators and workshop organizers had taken from the discussions during the afternoon of the previous day. Participants then discussed the draft principles at their table and provided input back to the group. At the end of the session, the workshop participants agreed in principle on the thirteen principles that they believed should be considered when designing any financial mechanism for green water investment, whether that is a redirection of existing funding sources or the establishment of a new fund. These principles are listed below.

Key Funding Principles for Green Water Investment

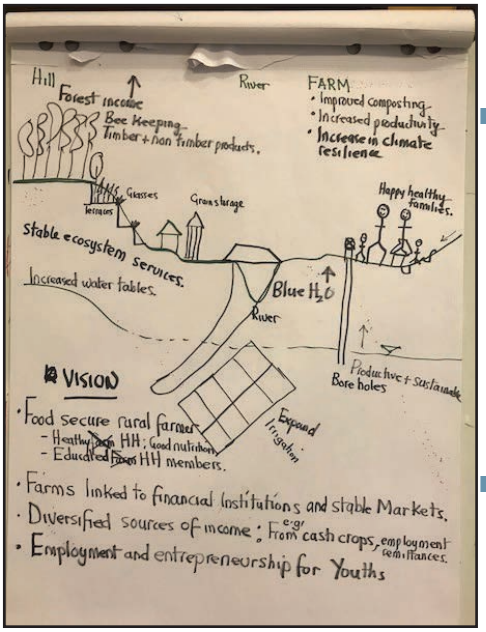
1. **Funds should be widely distributed, benefitting as many households as possible, while remaining financially viable and socially impactful.**
2. **Funded projects should be designed to ensure household-level sustainable livelihoods.**
3. **The funds should include market driven projects.**
4. **Inclusivity should be reflected as a primary value of all investments, both in terms of gender and youth, to promote positive social impact and avoid any potential negative externalities associated with investments.**
5. **The funds should adopt an evidence-based approach that draws on previously established best practices.**
6. **Funding should be results-based and apportioned based on the measurable achievement of outcomes.**
7. **The fund should use an innovative blended finance approach to catalyze public and private resources.**
8. **The intervention should be scalable and replicable throughout agricultural zones, with a goal to cover the continent.**
9. **The design of the funds should guarantee the political will and commitment from government and policy makers, to create institutionalized solutions that survive beyond individual champions and ensure the longevity of the project.**
10. **The fund should have an intelligent mix of green and blue water investments to have the best investment outcome.**
11. **Achieve an integrated approach that builds resilience and environmental sustainability for smallholder farmers, pastoralists, and other vulnerable population in the region.**
12. **Use bottom-up, human-centered design principles to increase benefit to the livelihoods of smallholder farmers, pastoralists, and other impacted households, while also increasing the successful adoption of the program.**
13. **Funding should be informed by participatory processes with farmers, green water experts, and major stakeholders to review both the quality of design and afterwards the performance of funding.**

A Picture is Worth A 1000 Words

The visioning session continued during which participants were asked to work in small groups to draw their "vision for the green water initiative".

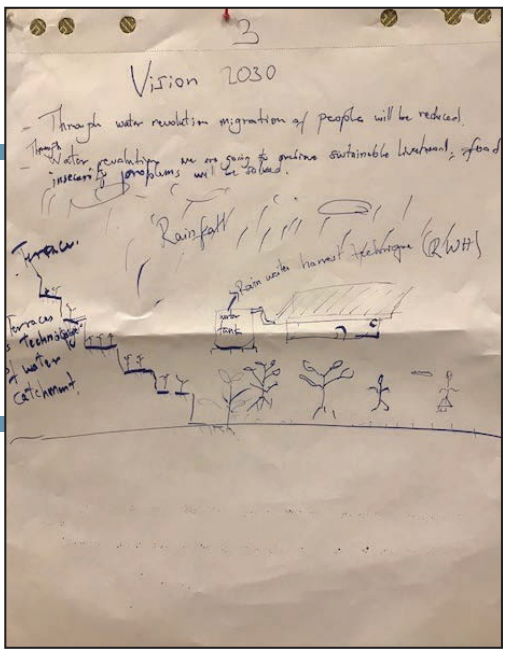
Participants were asked: Where do you want this initiative to be by 2030? What would be achieved by then? How will we get there? What are the top 1-3 major accomplishments or big wins along the way? They were encouraged to be ambitious and "think big."

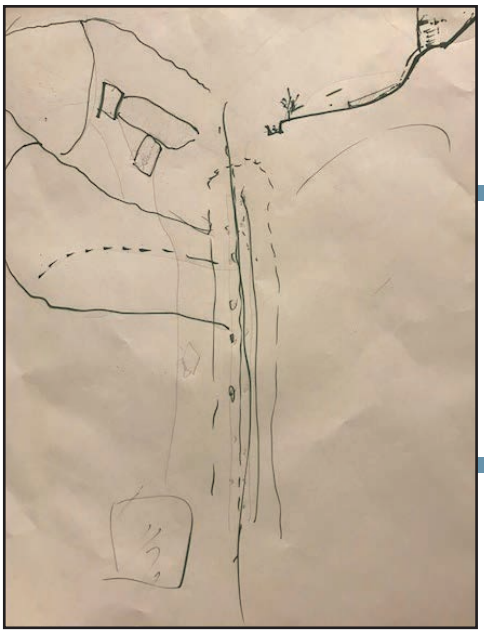
Participants then came back together and interpreted their pictures for the group. The following are the pictures and brief summary of their statements.



Envisions a food secure rural community with healthy households, well-educated farmers, who are not only relying on farming for income. All farms are linked to financial institutions; there are stable markets; youths are employed and involved in entrepreneurship activities. The landscape is covered with forests, and is well terraced, conserved; There is expanded irrigation and high productivity. Increased climate resilience due to stable environment and stable incomes.

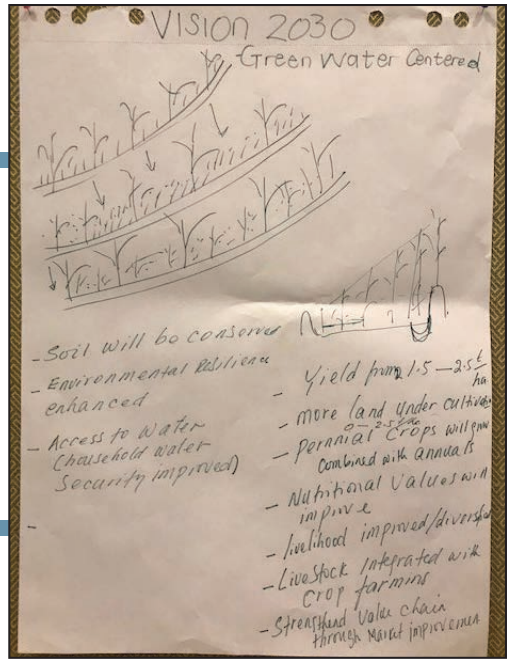
Rural households are harvesting rain water using various techniques for farm irrigation such as rain water harvesting and terracing, with increased vegetation and the capture of and storage of rainfall; there is no food insecurity, there is no migrations to look for jobs; men and women are working together.

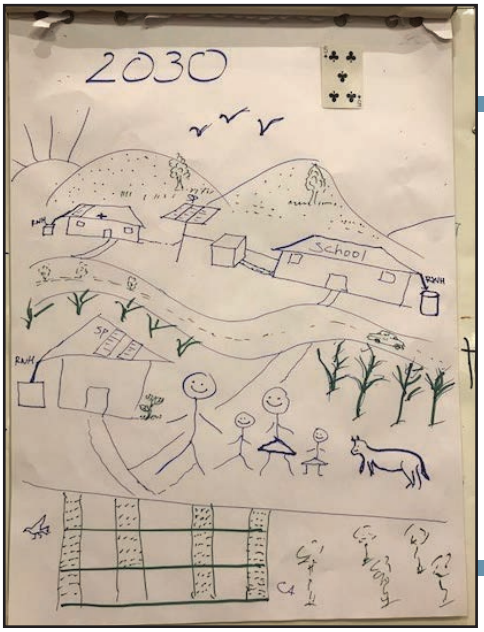




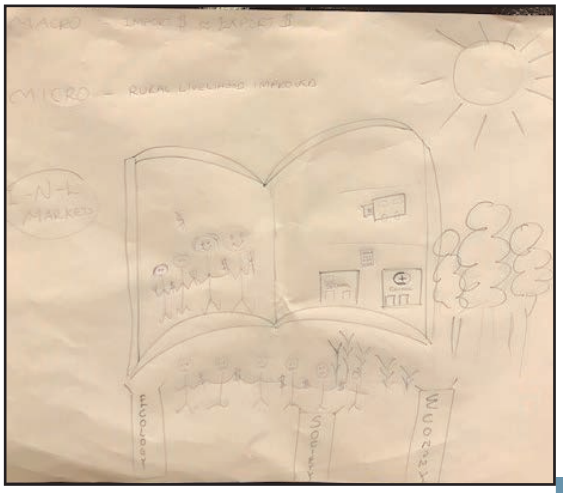
"We" envision a river catchment approach, with localized green water management at sub-catchment level (water storage, supplemented by small irrigation system). The river should have buffer zones with trees planted on the banks. Water resource can be shared and smartly-used along the river basin with an integrated approach.

"Our" picture shows access to water + food security. With green water techniques (such as bunds), productivity will increase, bringing currently uncultivated land into arable land. Agroforestry and crop diversification will be implemented. Livestock production will also be improved. Value chain intervention will reduce forced migration into cities. Youth will be proud to be farmers as promising professional careers.



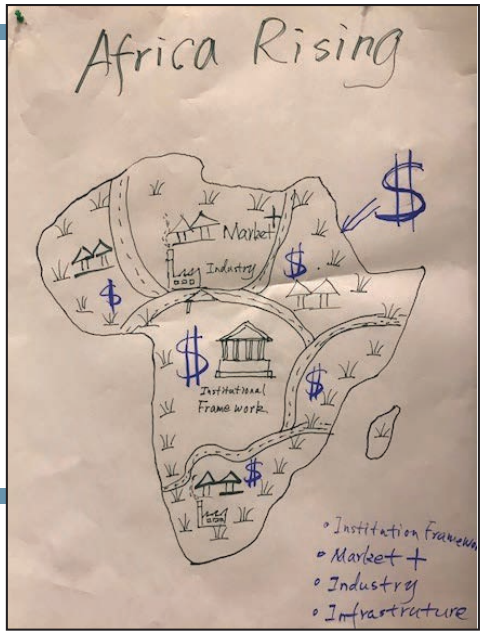


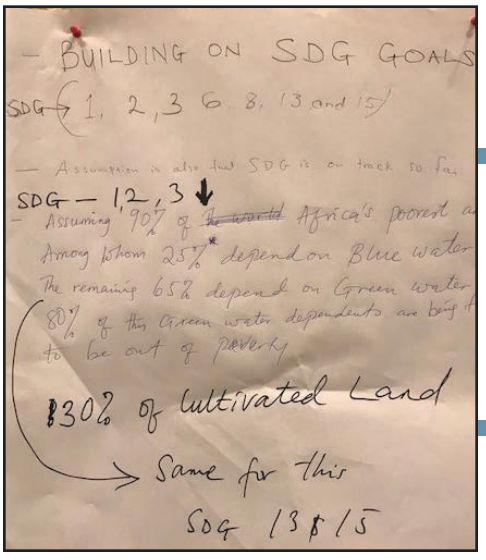
"Our" vision is of a sustainable environment with crops, forests, and livestock. Green water management is water conservation. There will be better crop/vegetation growth and increased yields. Uncultivated land is turned into productive land, growing perennial and annual crops, improved livestock husbandry, more crop diversification, and opportunity for value chain addition. Increased access to water for households and less forced migration to cities. It is a sustainable clean environment, using renewable energy sources (such as solar panels to power schools) and linking production to markets.



"We" take a knowledge/awareness-based approach as represented by the book. Change will happen at both macro- and micro- levels. "We" envision a balance between exports and imports. Families will have sufficient income, there will be good infrastructure, schools, health care, and access to markets. There is a mixed farming system combining forestry and crops. There will be continued dialogue on how to sustain the system through partnerships. Finance will be available from donors. Clean energy facilities will be installed. The vision is built on three pillars of the SDGs: environmental, social, and economic sustainability. Youth will be interested in farming. Gender equality is also included in the vision.

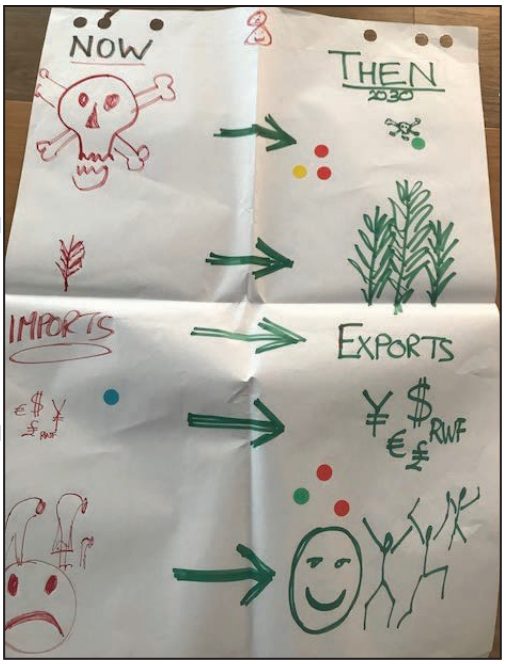
"We" show "Africa Rising." Our picture has four key messages: 1. "Green Africa": agriculture will be the bedrock of industrialization and the continent's development. 2. Financing will come from within and outside of Africa to support the development. 3. Institutional frameworks (laws, regulations, and organizations) are at the heart of the vision and will be built based on existing processes. 4. Modern infrastructure and clean energy will be available to facilitate the continent's development. The funding will also support the youth who are the key for the agriculture development in the future.





"We" link green water management with the SDGs, especially SDGs #1, #2, #3, #6, #13, and #15 – as the majority of African population currently works on agriculture. There will be a better urban / rural integration in the future. Green water investment will address malnutrition, and help achieve climate resilience.

"We" show a "Now vs Then" comparison, regarding environment, productivity, export, financing, people's livelihood. The future will be better in all these aspects thanks to green water investments.



Session 2: Key success factors

The next session looked at key success factors for delivering on the vision.

The session began with a presentation by Eng. Philip Gichuki, Chairman of the Upper Tana- Nairobi Water Fund Board of Trustees and formerly, the Managing Director and Chief Executive Officer of Nairobi City Water & Sewerage Company. Eng. Gichuki also attend the workshop as a representative of The Nature Conservancy (TNC) Africa and its Water Funds program. Eng. Gichuki presented a case study of The Upper Tana – Nairobi Water Fund Partnership. More detail regarding Eng. Gichuki's presentation can be found at **Annex 3B**.

The Upper Tana-Nairobi Water Fund Partnership illustrated a successful example of a public-private partnership around water conservation and "green infrastructure," addressing numerous challenges of the Tana River basin, a critical source of water for both rural people and the inhabitants of Nairobi. A fund has been established with both public and private investments, which are being used for water and soil conservation. In addition to investing in conservation measures in the farmlands and forests surrounding the river basin, the fund is also investing in various capacity building measures, with farmers, youth and women, including linking them to the private sector. Key success factors that Eng. Gichuki noted for the Fund included:

- ✓ A convener (TNC) for the initiative and commitment of all stakeholders, including government and farmers;
- ✓ Proper awareness building among and involvement of the farmers;
- ✓ Financial resources secured based on a business case for the farmers;
- ✓ Interventions based on farmers' actual needs and use of local knowledge, then involved financial institutions and agro-industries, and used ICT for improved farming practices; and
- ✓ Plan for sustainability

Following the presentation participants reflected on the case study and during the Q&A the following additional items were discussed:

On the plan for sustainability, Eng. Gichuki commented that this included: involvement of extension workers to build the capacity of farmers, use of local materials, establishment of the endowment, and promotion of high value crops (fruit trees, coffee). He further commented that there are plans to replicate the Upper Tana River Fund elsewhere in Africa (South Africa, Angola, Tanzania, Ethiopia, Rwanda, Kenya and Morocco) that the AWR organizers should consider ways to collaborate.

Regarding the strategy to ensure buy-in from existing and future stakeholders, Eng. Gichuki described the governance structure of the Fund. It is registered as a charitable organization and the government is represented on the board of trustees. There is also a management board and an advisory board, all providing opportunities for the involvement of stakeholders, including farmers. Participants commented that the AWR should take note of this governance structure.

It was noted that IFAD and the Global Environment Facility (GEF) have contributed to the Fund.

In summary, participants thought that there were many key success factors to be learned from the Upper Tana River Fund and should be thoughtfully considered when designing any new fund for the AWR.

Session 3: Stakeholders, key players and partners

This next session focused on the WHO - who should be part of the AWR?

In plenary, participants identified the different stakeholder groups, specific individuals and organizations that need to be engaged and who might be the potential partners, funders, champions of the AWR moving forward. Participants then worked in groups to map out the various roles and responsibilities for stakeholders at different levels, with a particular focus on leadership. During the group discussions the participants identified the following stakeholders to be involved in the AWR:

International Organizations/NGOs/Multi & Bi-Lateral Donors

1. SIWI
2. SDGC/A
3. SRC
4. GRP (Global Resilience Partnership)
5. GWP (Global Water Partnership)
6. FAO
7. AU
8. AMCOW
9. UN
10. UNEP
11. IFAD
12. IWMI
13. AFDB
14. CGIAR institutions
15. Green Business Team
16. International Union for Conservation of Nature (IUCN)
17. Billion Dollar Business Alliance

Government

1. Ministries of Agriculture
2. Governments (all levels), including Local Leaders
3. Water Utilities

Climate Facilities

1. Global Climate Facility (GCF)

Funds

1. Kenya Water Sector Trust Fund
2. Dabane Trust

Agricultural Organizations

1. Sustainable Land Management Initiative
2. Commercial Agriculture Development Project (CADP)
3. Technology for Africa Agriculture Transformation (TAAT)

African Forums and Pan African Organizations

1. African Forum for Agricultural Advisory Services (AFAS)
2. Global Alliance for Climate-Smart Agriculture (GACSA)

Regional Economic Commissions

1. Arab Maghreb Union (UMA)
2. Common Market for Eastern and Southern Africa (COMESA)
3. Community of Sahel-Saharan States (CEN-SAD)
4. East African Community (EAC)
5. Economic Community of Central African States (ECCAS)
6. Economic Community of West African States (ECOWAS)
7. Intergovernmental Authority on Development (IGAD)

Others – General Categories from Farmer to Private Sector

1. Small-scale Farmers
2. Farmer Organizations
3. Villages and Communities
4. Community-based Organizations
5. Civil Society Organizations
6. River Basin Organizations
7. Faith-based Institutions
8. Research Institutions
9. Academic Institutions
10. Financial Institutions
11. Private Sector Participants

In identifying the roles needed for the organizations to succeed, participants agreed the following were important:

- Championing the cause
- Resource mobilization
- Knowledge creation
- Convening stakeholders, partners, donors
- Input supply
- Experience sharing
- Financial services
- Regulation and Management
- Monitoring and Evaluations
- Planning
- Outreach
- Facilitation
- Networking.

Participants indicated that certain actors would be valuable with respect to certain of the key roles:

Private Sector: Developing infrastructure, creating jobs, creating market value and evaluating the value chain, considering input supply, providing technical support, establishing credit lines and financial support, and mechanizing the entire process.

Multilaterals: Providing loans and grants, de-risking through financing (e.g. role of World Bank), influencing policy, contributing to knowledge creation and management, cross-regional learning, capacity building.

Farmers: Forming self-help groups at the micro level, forming cooperatives at the watershed level, involving local leadership and traditional leadership for service provision; should be responsible to service providers, provide accountability and be good investees.

African Union: Setting a clear agenda and policy framework, establish political will and aligning commitment (e.g,. CAADP).

Global climate fund: source of resource mobilization, project financing, result monitoring, process monitoring, project networking and general advocacy.

Regional Economic Communities: Advocacy (both regional and creating a platform for sharing), facilitating resource mobilization, facilitation of free trade in agricultural products, policy harmonization on matters that are trans-boundary.

National governments: Find champion governments, role of policy making and regulation, capacity

building, advocacy, embedded into national strategies, allocation of funding, monitoring and evaluation, fund mobilization.

NGOs: Knowledge generation and sharing at grassroots, capacity building, advocacy for policy influence, pass on needs and concerns expressed at the grassroots, implementation and scaling up, resource mobilization, networking.

Research: Develop innovation for agriculture technologies resilient to climate change, transfer technology in a multidisciplinary and coordinated way, establish strong network of research institutions across the continent, create farmer-researcher linkage to create demand drive research, measure and evaluate impact.

Closing Remarks: From Vision to Reality

The final plenary session to the workshop discussed how to move from "design towards action."

The session began with key points from the plenary discussions followed by observing what happens next, the roles that stakeholders would play, looking at green water as a cost-effective solution that will also help the country as it has been shown to be helpful in Asia and America. Participants noted the barriers to scale including finance, governance, skills and capacity research, and global order. It was noted that it is important to think towards 2030 and use the success factors from the case studies.

Following the opening discussion, Mr. Torgny Holmgren presented some next steps for after the workshop. First a report of the workshop will be sent to all participants; afterwards there will be a finalized thought leadership piece (adapted from Mr. Abrams paper) and a project document which will further layout the who/what/where/when and how for scaling and funding green water investments across Africa. In addition, there will be outreach and engagement with other stakeholders and an advisory group and/or a "green water network" established. SIWI, SDGCA/A and SRC desire to work with these stakeholders / through this network to help in the design of the High-Level Roundtable in early 2019.

Mr. Holmgren stated that, through the workshop, a common platform has been created to take the AWR further. Now, an institutional framework and the need for funding are crucial for the success. SIWI and SDGC/A will engage with key partners to form an advisory group and a network. Mr. Holmgren reflected on multiple events coming up in the coming six months such as World Water Week in August 2018, the AGRA African Green Revolution Forum and UN General Assembly, both in September 2018, and the Africa Water Week in October 2018. All of these lead up to the High-Level Roundtable for the AWR in 2019, at which the target audience will be political leadership, donors and funders.

Mr. Holmgren finalized his closing remarks by asking participants in the workshop to engage with their own institutions and networks on the topic; to advocate for financial interventions to support the scale-up of green water solutions; to keep SIWI and SDGC/A abreast of their activities and engagements; and to provide input and recommendations on the AWR initiative. Mr. Holmgren believed that participants' understandings on the need and role of an "African green water revolution" have deepened and broadened from the two days of the workshop.

Dr. Belay Begashaw then gave his closing remarks, focusing on the financial requirements. In Dr. Begashaw's belief, "*finance is the outstanding issue for green water investment.*" He went on, finance is crucial for all the SDGs. These are comprehensive and interlinked, and the time frame is short. He stated that although the workshop's main focus is water, all SDGs should be viewed comprehensively and SDGC/A and SIWI will encourage implementers, funders and governments to think of all interventions holistically. But for the AWR, water is an entry point for helping achieve the SDGs in Africa and is one of the biggest constraints to development. From this workshop, [we] believe we can scale green water and now need to create the common platform to take it further, but we cannot do this without funding.

"All financial institutions have to make a commitment to work on resolving this issue. The political will is strong, but there is huge constraint on resources. We need to be creative in our funding strategy. We need to look at good policies and blended finance solutions to unleash the potential for water system…We expect to establish a fund for green water investment, and any fund must have a graduating strategy, transparency and accountability…We hope existing financial institutions can fine-tune their resources to work in this area…We hope all the participants today can help align their institutions' operations with this thinking. The principles we came up with can be summarized in 3 principles: inclusivity, scalability, sustainability. We will keep on working on these ideas and recommendations from this important meeting."

Dr. Begashaw thanked all of the organizers, including the staff of SDGC/A and SIWI, and participants for such a productive workshop and noted that it was a very important step in moving towards the January High-Level Roundtable.

In conclusion, participants at the workshop agreed that, although definitions vary, a combined green-blue approach to providing water for agriculture is a climate-smart, cost effective and sustainable approach to enhancing community-level resilience and food security. It will reduce long term reliance on funding for mitigation of climate-related disasters such as floods and droughts. As noted in examples provided during the workshop, including for the Nairobi Water Fund, green water technology and governance also allows for a participatory approach to water supply and increases the participation of women and youth in agriculture. Participants emphasized that already there is a great reliance on greenwater use on the continent with a large amount of traditional practice and knowledge built up that can form the foundation for an initiative to attract funding and investment to upscale the impact of locally-rooted technologies and practices. However, more work is to be done to build the business case, outline the pathways to scaling and to bring on board all stakeholders. Finally, all also generally agreed that it will not be possible to reach the SDGs in Africa without an AWR, based on green water exploitation, building community resilience for sustainable development.

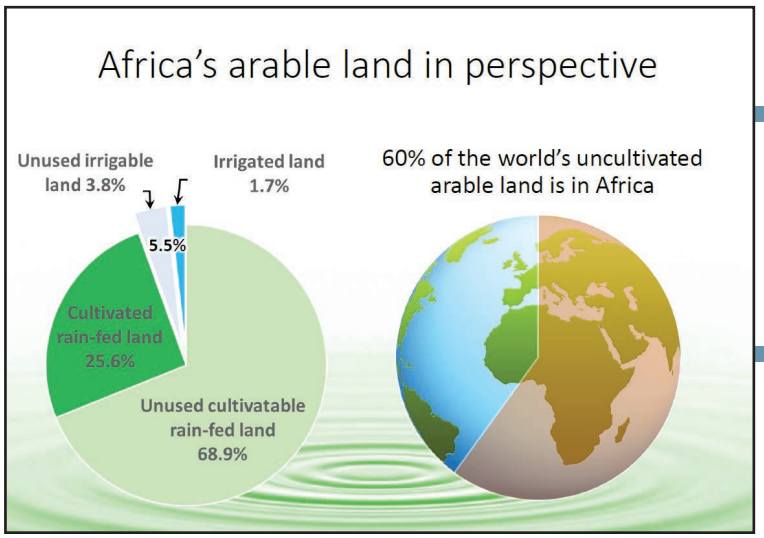
Field Visit: Witnessing "Reality"

At the end of the workshop, during the afternoon of Day 2 approximately 40 of the participants had the opportunity to visit the Rwamagana 34 site, part of the Government of Rwanda's Land Husbandry, Water harvesting and Hillside irrigation project.

The visit was led by a team from the Ministry of Agriculture and the Rwanda Agricultural Board. Rwamagana 34 project uses a combination of techniques and technologies in the construction and management of the land (e.g., soil bunds, terraces, waterways, afforestation and reforestation), developing land husbandry practices for both rain-fed and irrigated hillside agriculture. It was a great way to wrap up a productive workshop by giving participants the opportunity to view a large-scale integrated, blue and green water, project in Rwanda. It incorporated indigenous knowledge plus new technologies, involved the farmers and communities in the planning and implementation, and has capacity building and training as a fundamental part of the project. Finally, the project works with the private sector, taking farmers up the "value chain" of economic development. The visit brought to life many of the suggestions given by participants as best practices and key success factors during the workshop.

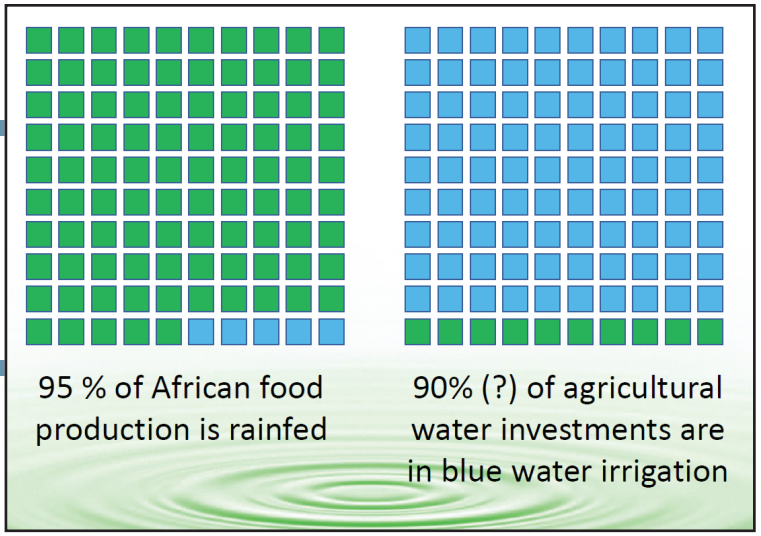
ANNEX III A

SUMMARY OF THE PRESENTATION BY MR. LEN ABRAMS FINANCING IMPROVED RAINFED AGRICULTURE SUMMARY POINTS

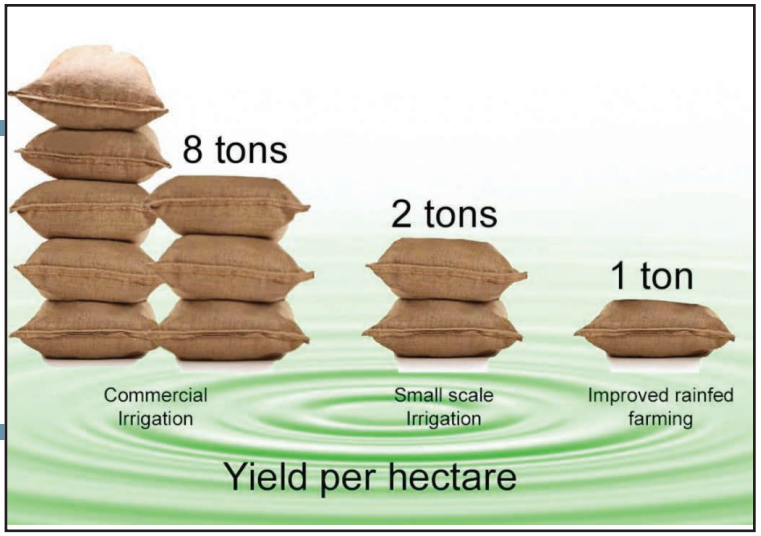


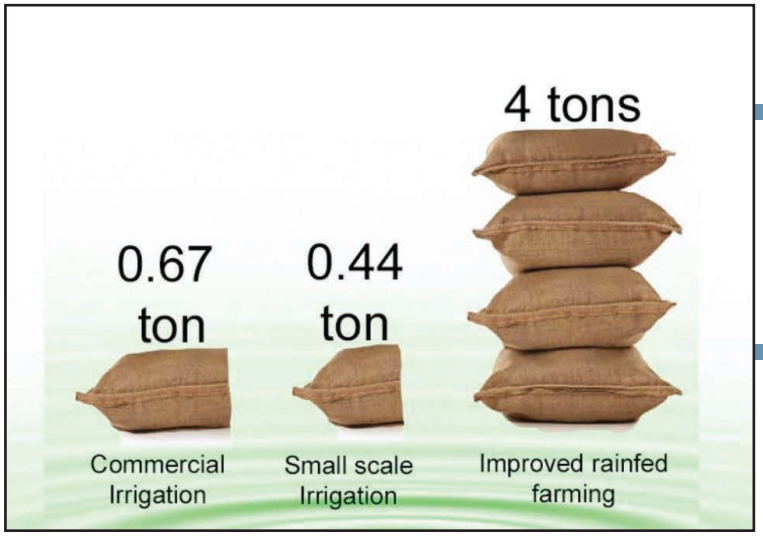
60% of the world's uncultivated arable land is in Africa. Unused cultivatable rain-fed land in Africa is 68.9%. *There is a lot of untapped potential.*

95% of African food production comes from rain fed land, yet approximately 90% of agricultural water investments are focused on blue water.



Yield per hectare from large-scale public & private commercial irrigation is 8 tons/ha, from small scale individual or community-based irrigation is 2 tons/ha and from improved rainfed farming is 1 ton/ha.





Investing $1000 increases yields by 0.67 ton/ha in commercial irrigation, 0.44 ton/ha in small scale irrigation and 4.0 tons/ha in improved rainfed farming.

This yield increase / $1000 invested is based on an assumption of infield investment costs / hectare (excluding costs of water storage and conveyance) of $12,000 for commercial irrigation, $4,500 for small-scale and $250 for rainfed.

Infield investment costs

Agricultural water management type	Cost / ha
Improved water management in rainfed farming	$250
Small-scale irrigation (individual, community-based)	$4,500
Large-scale public & private commercial irrigation	$12,000

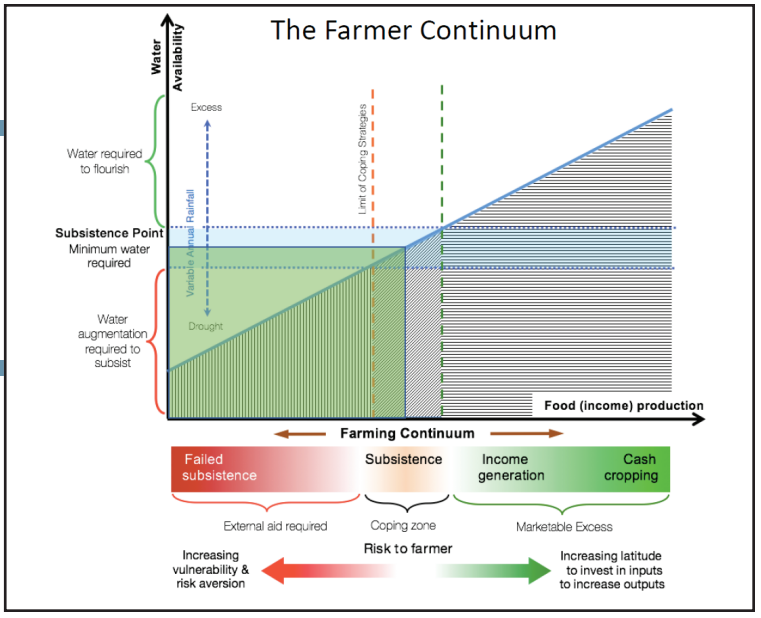
(Excluding water storage & conveyance costs)

Who are Africa's rainfed farmers?

The 'invisible' 60 – 70% of the continent's citizens

We should be "putting the farmers first. This is not charity, it is building sustainable livelihoods.

Farmers are engaged in subsistence agriculture by force of circumstance and their revenue is directly correlated with water availability.



Breaking the cycle

- Reduce seasonal failure & catastrophic risk
- Subsistence becomes the new low, instead of failure
- Average & good years produce marketable excess
- Build confidence and change risk based behaviour
- Move into income generation, join the value chain
- Build wealth -> improved health, education, etc
- Release human capital into the wider economy

A process – <u>beginning</u> with securing subsistence for as many people as possible

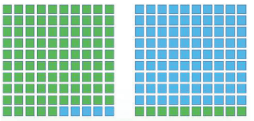
"Some for all – not all for some"

Farmers are risk averse and the future uncertainty of unpredictable rainfall inhibits farmers' investments. They cannot take advantage of good years and thus stay in the poverty trap.

Commercial blue water investments should by privately financed on their commercial merits and green water should be viewed as a common good, yielding higher public dividends (greater poverty & health impacts, increased national productivity, savings from decreasing imports, etc.) and should be publicly financed.

Public financing of **Green** water and **Blue** water investments

- Current realities – remember …
- Much of public agricultural blue water investment is commercial, high value, non-food production
  - There is nothing wrong with this in itself
  - But it is using scarce public resources for limited benefit in the context of pressing need
- Higher public dividends from rainfed agric investments
  - Higher food production per $ invested, greater poverty & health impacts, increase in national productivity, save on imports …



Therefore, commercial blue water investments should be self financing on their commercial merits & public funds should be used for the greater common good.

One option may be a **Green Water** Fund

Issues in the establishment of a Green Water Fund

- Hosted or stand-alone fund?
- Governance
- Fund capitalisation and replenishment
- Operational procedures
- Promotion, advocacy and awareness creation
- High level endorsement
- Past experience of "Funds", eg. Time frames, risk etc….

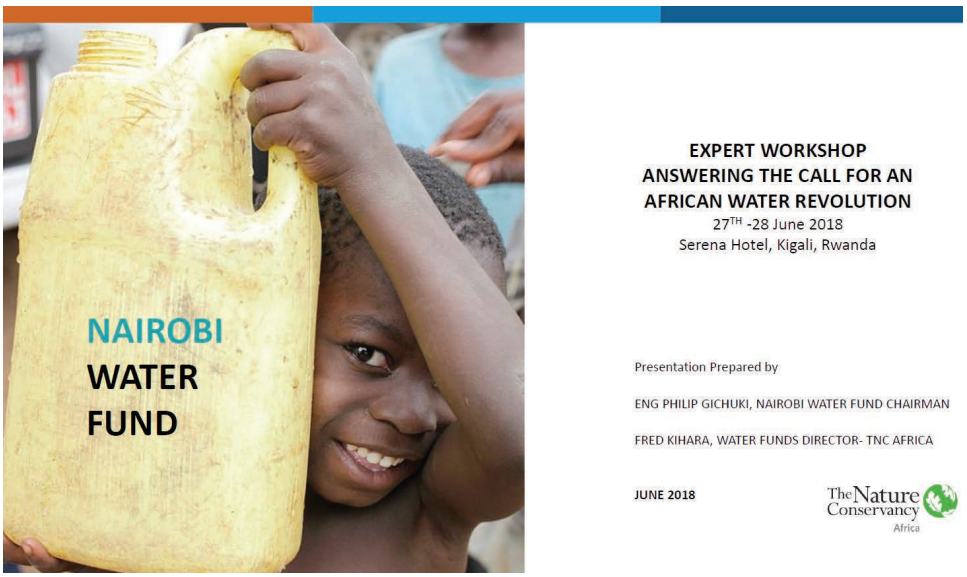
The process for green water investment should begin *"with securing subsistence for as many people as possible. Some for all – not all for some."*

ANNEX III B

SUMMARY OF PRESENTATION BY ENG. PHILIP GICHUKI UPPER TANA – NAIROBI WATER FUND PARTNERSHIP

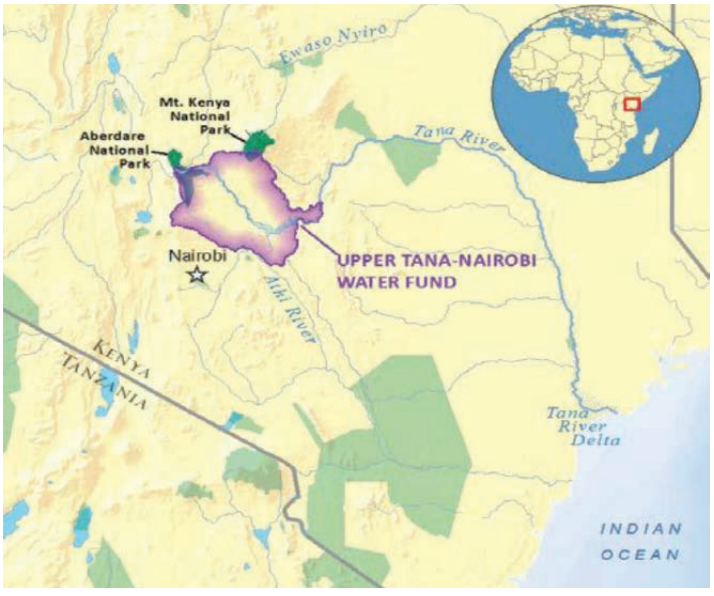
Water is Life!

The Upper Tana – Nairobi Water Fund Partnership



Using experience from water funds established by The Nature Conservancy in Latin America, the Upper Tana- Nairobi Water Fund is a partnership in Nairobi, Kenya to fund upstream water conservation, investing and mobilizing more than $90 million directly into watershed conservation to help protect and restore the quality and supply of water to one of Kenya's most productive and economically important regions. [1]

The Tana River originates from the Central highlands of Kenya and then travels over 1000 km before discharging into Indian Ocean. The water it provides is of critical importance to the Kenyan economy. It fuels one of the country's most important agricultural areas, provides 65% of Kenya's hydropower output, and supplies 95% of Nairobi's drinking water. However, there are now **numerous challenges**: forests on steep hillsides and areas of wetlands have been converted to agriculture. As a result, sedimentation is becoming a serious problem, reducing the capacity of reservoirs and increasing the costs for water treatment.



[1] https://www.nature.org/ourinitiatives/regions/africa/upper-tana-nairobi-water-fund-business-case.pdf

Today, 60% of Nairobi's residents are water insecure as residents and land productivity has been reduced. In addition, the capacity of hydropower reservoirs has reduced. The challenges to water security will likely grow as climate change brings increasingly unpredictable rainfall.

The Upper Tana Nairobi Water Fund, "the first of its kind in Africa," was brought to life in 2012 as a collaboration between The Nature Conservancy, governments, businesses, partners and communities to restore the Tana River watershed area, guide sustainable development of the river and ensure water security for all. The Fund is a public-private partnership to fund land-conservation measures upstream.

It was founded on the principle that it is cheaper to prevent water problems at the source than it is to address them further downstream; investments in green infrastructure using natural systems to trap sediment and regulate water often provide a more cost-effective approach than relying solely on grey infrastructure such as reservoirs and treatment systems.

Donors and major water consumers 'at the tap' are contributing to the establishment of a $15 million endowment; to date $8 million has been invested by the public sector, $6 million has been pledged by the private sector by 2020 and $1 million has been raised as endowment seed capital. The funds are then used to support water and soil conservation measures 'at the top,' which benefit local farmers through increasing agricultural yields by reducing soil erosion that affects both crop production and downstream water quality and supply. A 2:1 return on investment is expected and with the endowment, funding is projected to be sustainable.

***"We have two purposes in Tana: conserve the soil and make our water better."* – Jane, a farmer in the Upper Tana**

But not only is the Fund investing in necessary remedial measures in farmlands and forests, but from 2012-2018 the fund built the capacity of 25,000 farmers, engaged private sector companies on such things as drip irrigation and high value fruits promotion, leveraged the capacity and skills of youth, contributed to energy self-sufficiency and enlisted 18,000 farmers on a mobile phone platform. The Fund has a pro-poor focused empowerment initiative and deliberately extends higher subsidies to women led rural households and elderly citizens.

Key success factors for the Fund are:

- A convener (TNC) for the initiative and commitment of all stakeholders, including government and farmers
- Proper awareness building among and involvement of the farmers
- Financial resources secured based on a business case for the farmers
- Based interventions on farmers' actual needs and use of local knowledge, then involved financial institutions and agro-industries, and used ICT for improved farming practices
- Plan for sustainability

Contact

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